RUBBER and PLASTICS WEEKLY

VOLUME 140 NO. 16 APRIL 15 1961 ONE SHILLING

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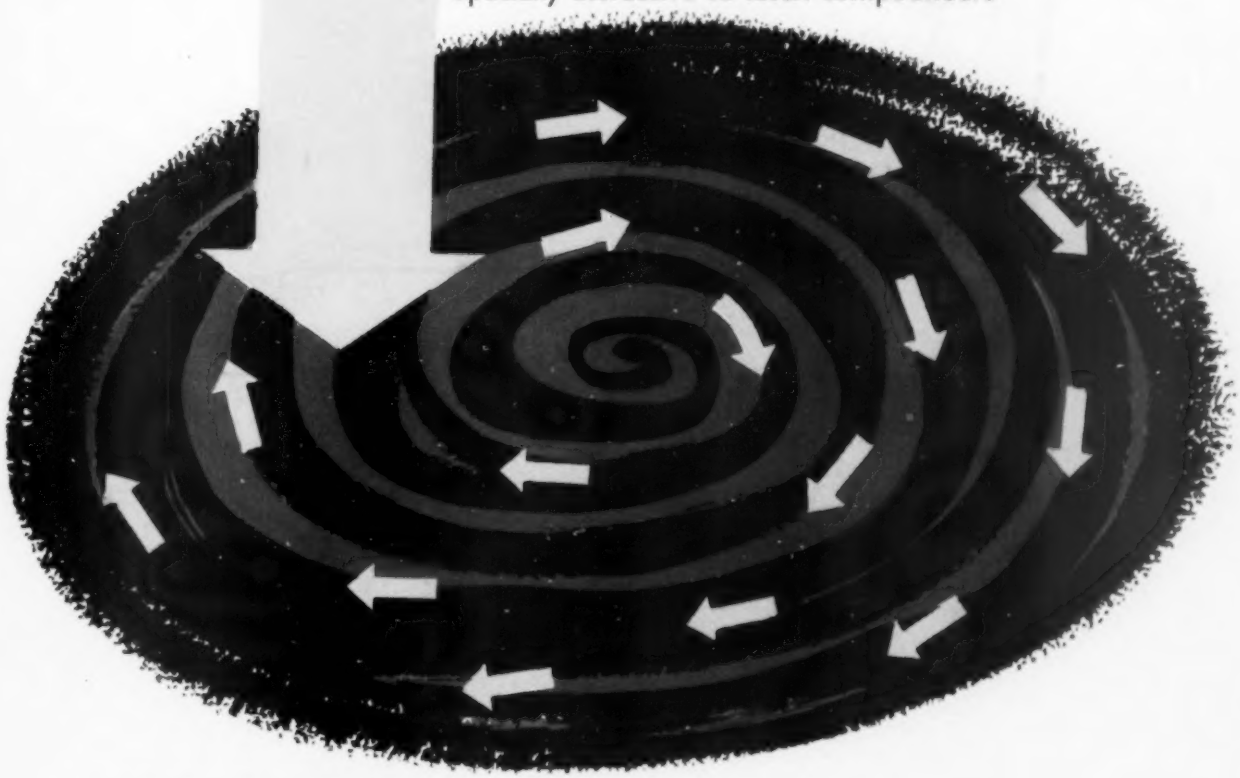
Specially attractive to latex compounders



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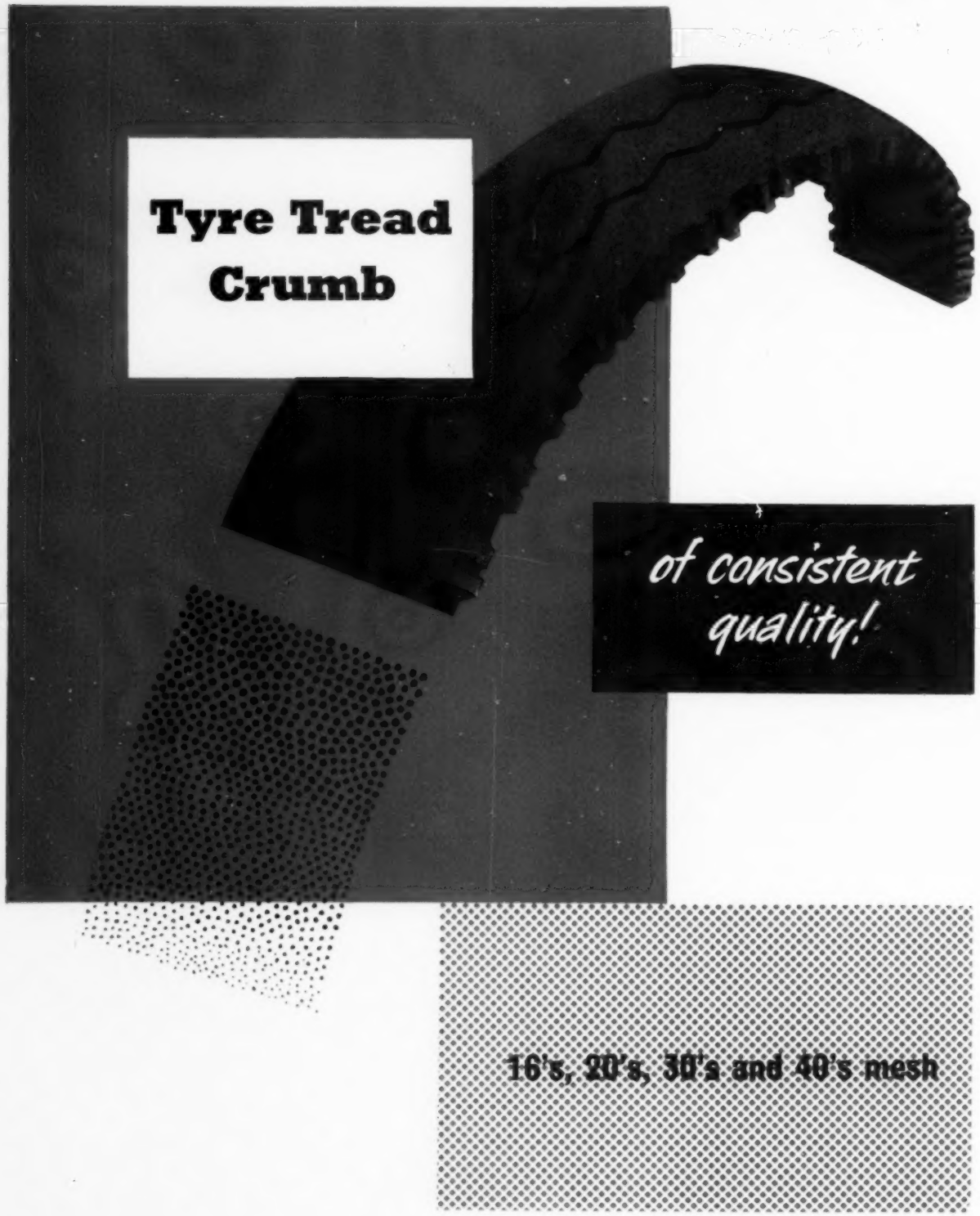

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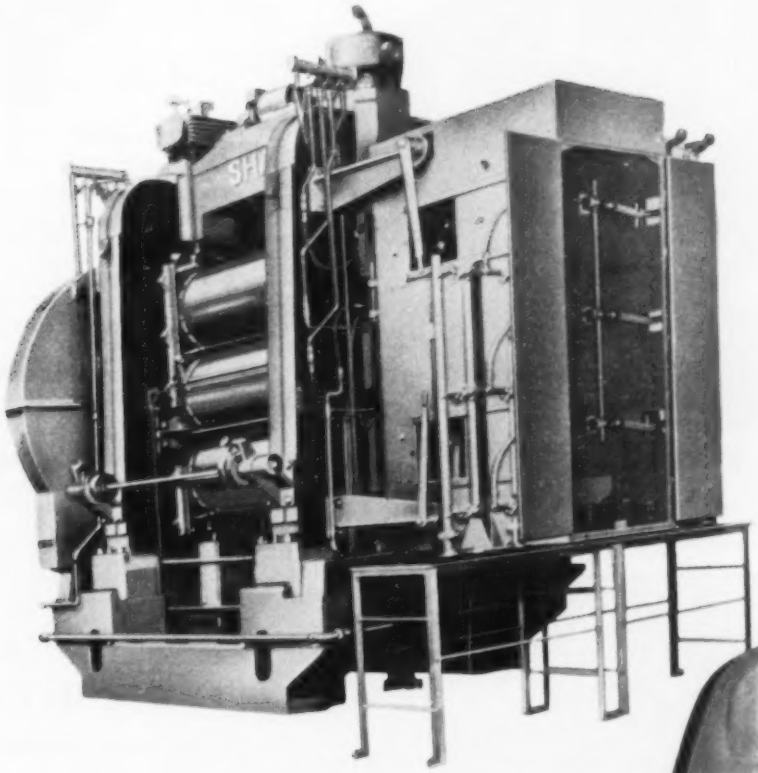

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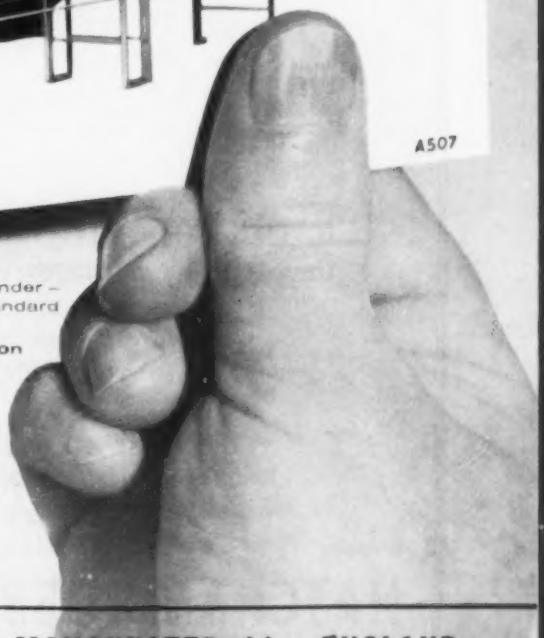

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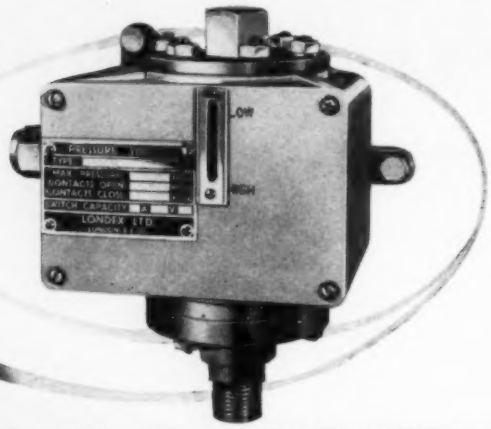

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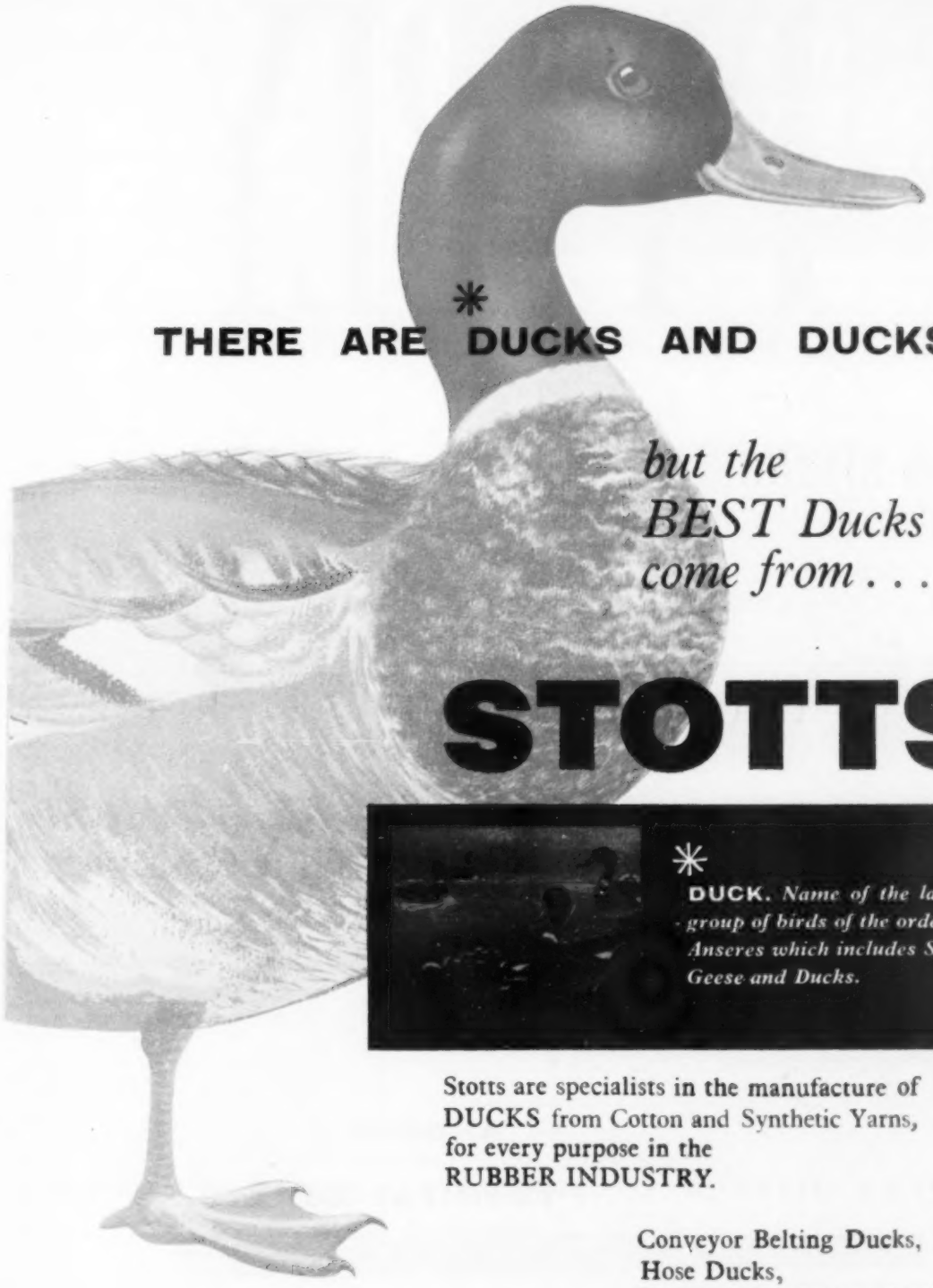

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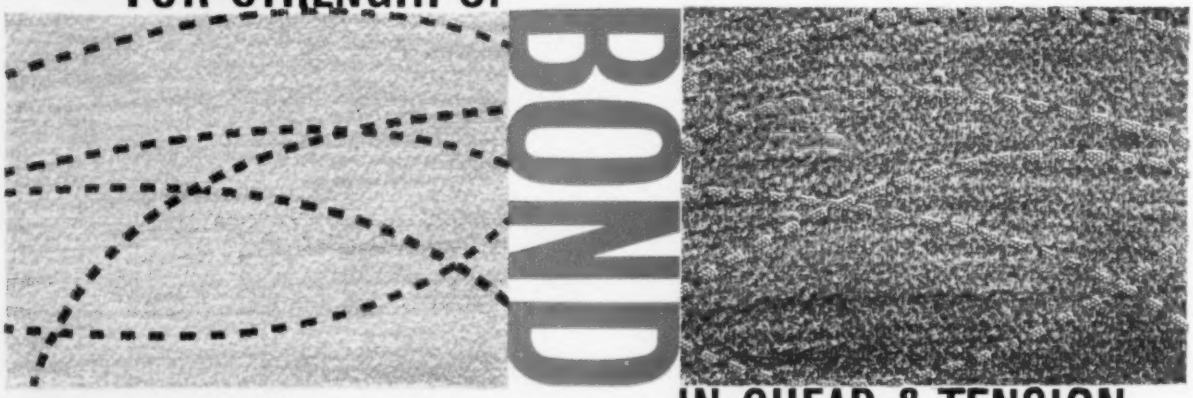

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RUBBER and PLASTICS WEEKLY

Formerly 'Rubber Journal and International Plastics'

Volume 140 *IN ITS 77th YEAR* **No. 15**

April 15 1961

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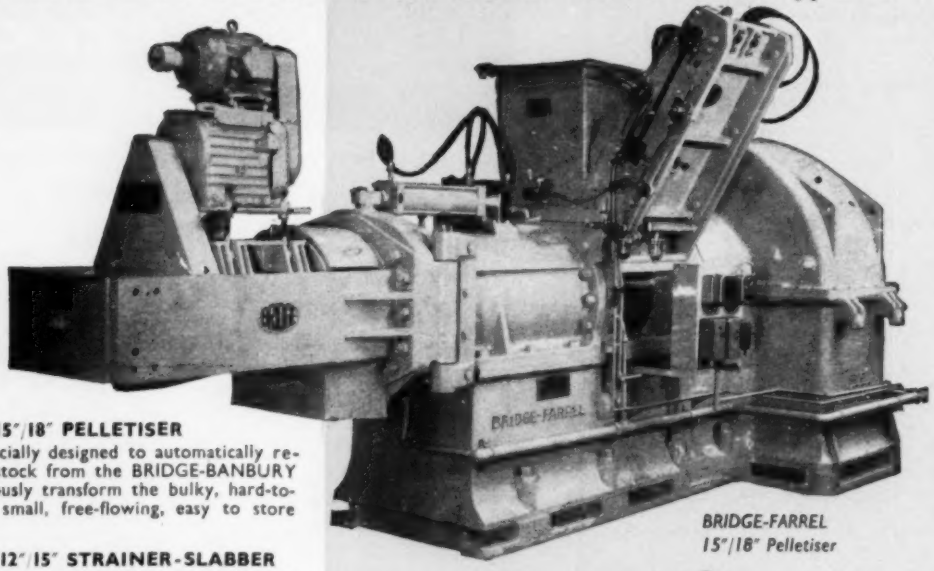

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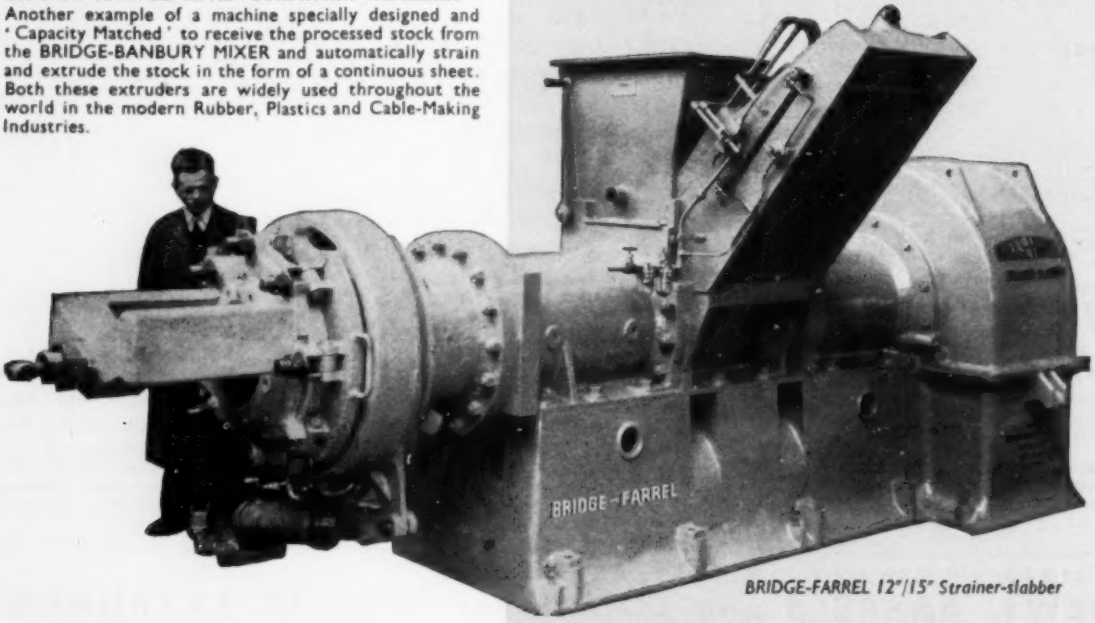

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NOTES of the WEEK

Staffing the Stand

INTERPLAS — the International Plastics Exhibition at Olympia — is now only two months away. For ten days Olympia will be the focal point of the European plastics industry, a shop window displaying everything from processing machinery to tiny end products. How to capture attention amongst such a variety is a difficult problem; how to hold it is an equally difficult but not so generally recognized problem. A firm may spend much money, time and ingenuity on its stand, and it may have plenty of technical literature available for distribution. But, quite often, the last thing of all to be decided is: who is to staff the stand? Eventually a rota is prepared, people frequently being chosen for their availability rather than their suitability.

The result is that an interested visitor to the stand may receive only vague answers to his enquiries. He may be told: 'The gentleman who deals with this has gone out to lunch', or be handed a brochure which bears no relation to his enquiry and told: 'It's all in there'. As a consequence of this, orders as well as tempers can be lost.

The solution lies in realizing that staffing an exhibition — and particularly a technical exhibition — stand is a specialist job. It should be done by the firm itself, and not an outside agency. And the people to do it are obviously the sales and technical sales staff who are normally in direct contact with customers, and who are used to assessing problems quickly and deciding on the best route to an answer. This needs as much careful planning as the stand itself, but it is only in this way that the firm can turn the attention captured by a good display into dividends.

Tradition Plus Adaptability

ONE of the features of the rubber manufacturing industry is that it contains many firms who have, through the years, built up a strong tradition without becoming too rigid and unreceptive to new ideas. This is a very necessary outlook in an industry where, as the pages of this journal testify, every week sees the development of new ideas, materials and processes. A firm that is a good example of this 'tradition plus adaptability' approach is J. H. Fenner, the Hull power transmission firm — an appropriate example, because this year Fenner celebrates its centenary

Fenner, which was founded the year after Goodyear died, has always manufactured belting Its history is a record of new ideas grafted on to a solid accumulation of experience. At first it concentrated entirely on leather (an early advertisement describes the firm as 'Tanners, Curriers and Manufacturers of every description of Leather Belting'), then it turned more to woven textile belting. In the thirties it adapted itself again to rubber V-belts and since then has expanded rapidly to become one of the largest manufacturers of this type of equipment in the world. The dual approach we have been speaking of can be illustrated by a sentence from the company's *V-Belt Journal*. It indicates that in a centenary year 'a look over the shoulder is permissible' although — 'The next ten years are of more concern than the last 100'.

Consumer Communication

IT still comes as quite a shock to find out how little the general public knows about plastics. Many people even now regard them as one material in a number of different colours, and the retail trade does not help matters with labels such as 'Just like the real thing' and with the vague and often misleading information it passes on to the consumer. Bakelite's 1961 *Plastics Review*, published this week, contains a good analysis of this old problem of establishing communication between the plastics manufacturers and fabricators on the one hand, and the consumers on the other. It points out that the standard of plastics articles produced today is really very high, and that, if they prove unsatisfactory, it is more often than not because they have been misused.

Whereas the man in the street (and the woman in the kitchen) knows that metal will rust under certain conditions, and that wood needs to be finished, he is uncertain of the working limits of plastics. The Bakelite article contains a picture of a polythene colander which has been immersed in steam and cut with a sharp knife, and a polythene jug into which has been poured boiling fat. It is hardly surprising that housewives who are left to find out the results of this kind of disastrous treatment for themselves become prejudiced against plastics.

Consumer information is produced; but is it being put over effectively enough? No firm wants to stress the disadvantages rather than the advantages of a product, but clearly a warning line in small type at the bottom of a leaflet or advertisement is not enough. It would be easy to include a small picture of damaged articles with a clear warning. This would not detract from the sales appeal of the advertisement. As the success of consumer association reports shows, an increasing number of people prefer to be told the facts, rather than to be merely persuaded.

NEWS *Briefs*

PETROCHEMICALS FOR ISRAEL — SCANDINAVIAN FIBRE CO. — INDIAN POLYETHER FOAM — US TYRE PRICE — BICC IN CANADA — CHINA BUYS RUBBER

Rhodesia — Production at the Dunlop (Rhodesia) Ltd. plant in Bulawayo is being increased to satisfy the demand for tyres in the Federation of Rhodesia and Nyasaland, according to a company spokesman. Stating that the company recognized its responsibility to the public, he added that, to ensure there will be no tyre shortage, it would be prepared — in the unlikely event of a shortage — to import tyres at the higher duty if required.

Italy — According to the Italian Institute for Foreign Trade, foreign investments registered under the law of 1956 in connexion with rubber so far total 12.1 billion lire.

Canada — The largest oil-filled cable yet made by British Insulated Callender's Cables Ltd. for commercial operation has been manufactured for the Hydro Electric Power Commission of Ontario, Canada. The cable has a corrosion protection of self-vulcanizing rubber, pvc and hessian tapes.

Ceylon — Ceylon and China have signed contracts under which China will buy 31,000 metric tons of rubber in return for the purchase by Ceylon of 200,000 long tons of rice during this year. The price of rubber will be the weekly average of prices on the Singapore market plus a 5c. a lb. handling charge.

United States — Major rubber companies in Akron have indicated that they do not plan to follow the United States Rubber Co. in increasing prices of certain passenger car and lorry tyres. United States Rubber have made increases of 5% on first line passenger car tyres, and 2½% on highway-type lorry tyres.

Switzerland — The French firm of Kléber-Colombes recently set up a subsidiary in Zürich, Kléber-Colombes (Suisse) S.A., to handle sales in Switzerland of the parent company's tyres, rubber goods, latex foam and plastics.

Indonesia — An eight-year development plan was recently launched by Indonesia, and will cost about £1,900m. It will be largely devoted to setting up new industries, which will include chemical plant. The Board of Trade thinks that opportunities should arise for UK firms to supply a wide range of industrial plant and equipment for these projects.

India — The Government of India has granted a licence to the Bombay Housing Corporation to set up a new industrial undertaking at Wadala, Bombay, for the manufacture of 3m. sq. ft. of plastic paper laminates per annum. Foreign collaboration is envisaged subject to Government approval.

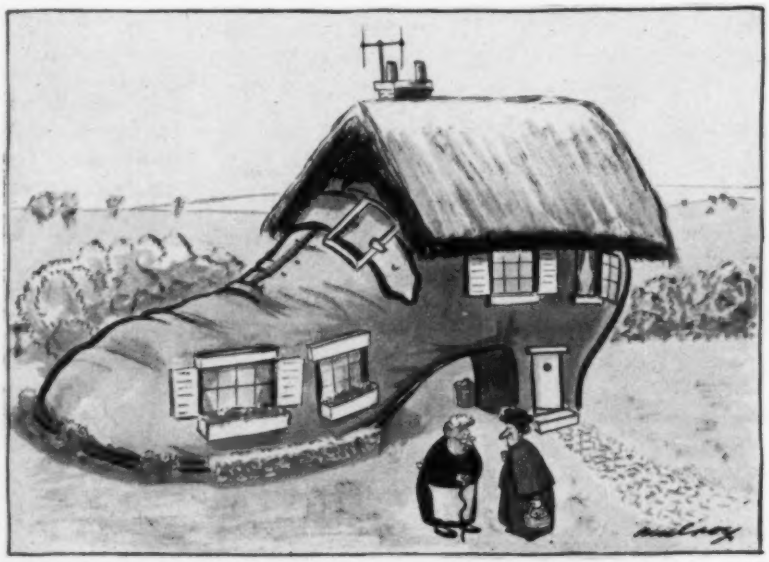
Holland — Kunstzijdespinnerij Nyma NV, of Nijmegen, Holland, and Esbjerg Tovvaerksfabrik AS, of Esbjerg, Denmark, are jointly establishing a company under the name of Nymeta AS, which will manufacture polythene monofilament and other fibres for the Scandinavian market.

Israel — A joint venture by Israeli, US, and Brazilian interests envisages the investment of £5m. sterling in a petrochemical complex of four plants in the Haifa area. Raw materials will be supplied by the Haifa Refineries. The project provides for the construction of an ethylene plant, with an annual capacity of 15,000 tons; a polythene plant producing 6,000 tons a year; a 20m. lb. carbon black plant and a plant which will turn out 6,000 tons a year of duodecyl-benzene, a raw material for detergent manufacture. The first plant in the complex is scheduled to start production in 1963.

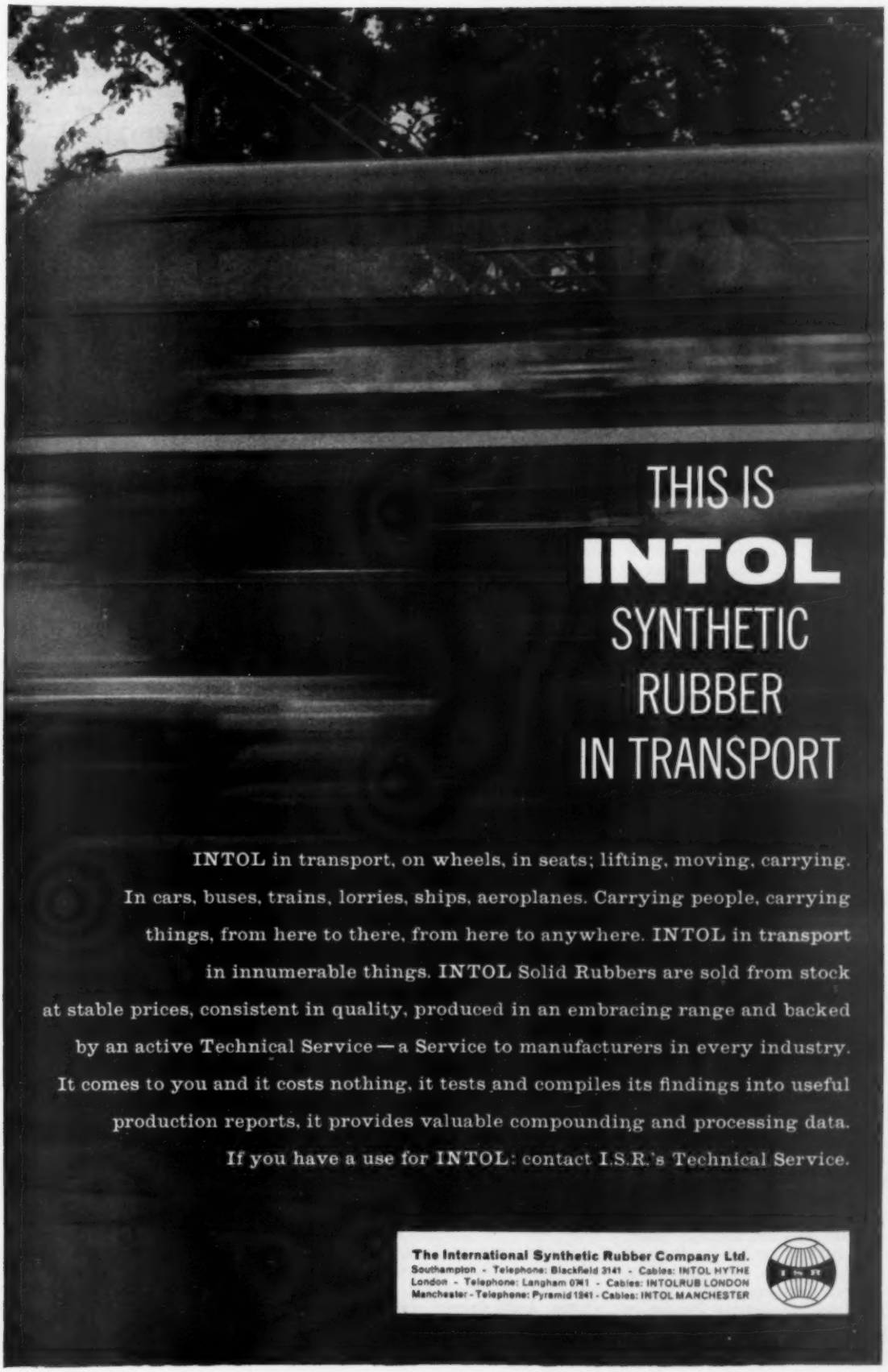
Canada — The Visking division of Union Carbide Canada Ltd. has purchased property at Newton, 30 miles south-east of Vancouver, where it will build a new 16,000 sq. ft. polythene film plant. The factory will be the division's third new production facility in the past three years, and its fourth polythene film plant in Canada.

United States — US Air Force and Navy contracts totalling $469,574 have been awarded B. F. Goodrich Aviation Products for aircraft deicers, brake assemblies and component parts for high altitude full pressure suits.

India — The first Indian foam plastic factory has gone into production in Hyderabad. Established at an estimated cost of £90,000, the factory will produce polyether foam. Installed capacity of the plant is 500 tons per annum, but actual annual production for the time being will be about 50 tons, owing to insufficient supply of raw materials.



'They didn't put expanded rubber-resin foundations in these old shoes — the damp plays hell with my rheumatics!' — 532



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Oil Refinery for I.C.I.

MULTI-MILLION £ PLANT ON TEES-SIDE

THE recent announcement by Imperial Chemical Industries Ltd. of their intention to build a plant capable of distilling about one million tons of crude oil annually, represents an important development in the process of vertical integration in the chemical industry. The Heavy Organic Chemicals Division of I.C.I., which will be responsible for building and operating the new plant, has not previously handled crude oil in its petroleum chemicals manufacturing operations.

Agreement has been reached with Shell-Mex and BP Ltd. for the supply of the necessary crude oil for processing and these companies will also market those of the new refinery's products not required by I.C.I.

The plant, which will cost several million pounds, is to be built on a 250-acre site on the north bank of the Tees and is due for completion before the end of 1962. It will consist essentially of a distillation unit designed to give flexibility, in order to permit a variety of crudes to be processed and to vary the end products.

Olefine Plant Feedstock

The light naphtha produced will be used to provide a proportion of the feedstock for the three olefine plants at Wilton, which currently handle about 600,000 tons of naphtha a year. This will give I.C.I. a much greater control over the raw materials needed for ethylene, of which Wilton will soon be producing 140,000 tons a year. This is used mainly to produce polythene and also in the manufacture of Terylene.

The site is on reclaimed land with a good river frontage on which a jetty is to be built to handle the crude oil and products to be despatched by river. The existing pipe-line linking the I.C.I. works at Wilton and Billingham runs alongside the site, so that transfer of refined products to either will be facilitated.

Only part of the area will be taken up by the present scheme, leaving ample room for storage facilities and future developments.

Polythene in E. Europe

£7m. CONTRACT FOR BRITAIN

CONTRACTS worth £7m. have been signed by Simon-Carves for the design of four polythene plants in Eastern Europe.

The four plants, in Czechoslovakia, East Germany, Poland and Rumania, will be built during the next three years with the assistance of Simon-Carves engineers, who will remain on hand until they come on stream.

All specialized equipment covered by the contracts will be manufactured in Britain. The technical 'know-how' is being supplied by Imperial Chemical Industries, for a sum which has not yet been disclosed. This is the first sale to Eastern Europe of polythene manufacturing secrets by I.C.I.

Firestone Sues General Tire

LATEST MOVE IN OIL-EXTENDED PATENT CASE

THE Firestone Tire and Rubber Co. of Akron, Ohio, has sued the General Tire and Rubber Co. over General's recently issued patent for the use of oil-extended rubber (*RPW* Dec. 24, 1043).

A suit filed at Baltimore, Maryland, asks that the patent be declared 'void and invalid', and asks the court to recognize that Firestone and its customers now possess the right to use oil-extended rubber freely and without restriction throughout the world.

The Small Firm

The McCreary Tire and Rubber Co. of Indiana, Pennsylvania, has joined Firestone as a plaintiff to determine its rights as a small, independent tyre company which uses oil-extended rubber manufactured and sold by Firestone. The plaintiffs believe a favourable ruling would set a precedent for 'the protection of all small tyre companies which use oil-extended rubber produced by Firestone and the other rubber firms'.

The suit was filed after General repeatedly threatened legal action against Firestone and its customers. It asks the court to restrain General from threatening legal action, charging infringement and otherwise harassing Firestone and its customers.

Firestone declared that recent actions by General are in violation of General's obligations under a research contract General held with the federal government from 1949 to 1955. All work by General on oil-extended rubber came under this contract and Firestone contends that it has already purchased rights under this contract from the government.

Third Law Suit

A Firestone spokesman declared that the principles involved were tremendously important because the public had already paid for the development of oil-extended rubber through government contracts, and a royalty to General would, in effect, mean a second payment by the public.

The suit is the third involving the patent on oil-extended rubber. Soon after the patent was awarded, General sued the Goodyear Tire and Rubber Co. and United States Rubber Co. in the federal court at Cleveland for patent infringement.

Business as Usual

Despite the disastrous fire which gutted one of the factories of Plastikade (M/C) Ltd., at Oldham last week (*RPW* April 8, 556), the firm is stepping up production at another site nearby. Additional machinery is being installed to meet the heavy load and other rubber manufacturers in the area are taking on work to be carried out to Plastikade specifications.

Over 100 firemen fought for five hours to control this fire at the Oldham plant of Plastikade (M/C) Ltd.

Damage to the factory is provisionally estimated at £300,000, and it is feared that the value of property salvaged will be only nominal. A decision on rebuilding the factory has not yet been made.

PVC Compounding and Processing

RECENT DEVELOPMENTS DISCUSSED AT NCRT SYMPOSIUM

THE National College of Rubber Technology presented recently another of its courses on subjects of interest to the polymer industry. This time it was organized as a symposium on 'Recent Developments in pvc Compounding and Processing'.

Judging from the attendance of about 280 people, including many from various European countries, the theme of the meeting aroused widespread interest. Seven papers were presented, and the college is planning to have the proceedings of the conference published as soon as possible.

C. A. Brighton (British Geon) set the scene of the symposium in the opening paper dealing with polyvinyl chloride itself and entitled factors affecting the properties of vinyl chloride polymers and copolymers.

World production is now running at considerably more than 1.5m. tons and if some of the promising developments which the speaker outlined really come to fruition, then consumption will go up much further before the growth curve flattens out.

Regulated Structures

It was now common knowledge, said Mr Brighton, that the properties of pvc, as did those of most polymers, varied significantly with the molecular weight, or K value. The molecular weight distribution was also relevant but perhaps more important still was the influence of the shape and size of the polymer particles. These were the main factors which decided whether the particular pvc would make a paste or easy processing polymer or any one of the other types that were now so widely used.

The development of new types of pvc with molecular structures differing from the current ones was not as widely appreciated. Mr Brighton spoke of polymers initiated by alkyl boranes, particularly at low temperatures, around −50°C., which had a regulated structure as opposed to the random arrangement characteristic of commercial material. This was reminiscent of polypropylene and samples of such pvc exhibited a corresponding increase in density, crystallinity insolubility and softening point. They also had a higher molecular weight.

These changes led, not unexpectedly to a higher processing temperature, which in view of the well known thermal instability of pvc, presented a difficulty which remained to be overcome. Decreased impact strength, as compared with normal pvc was another disadvantage. It was claimed however that adjustment of molecular weight and percentage crystallinity could result in a product that was processible at 200°C. using normal pvc stabilizers.

New Techniques

Post-chlorination of pvc held out hopes for interesting variations on the basic theme. This type of material was not new, and the Germans had been making it for some time. But Mr Brighton suggested that newer techniques using photochemical chlorination in aqueous dispersion at relatively low temperatures gave rise to polymers with an improved thermal stability. These had, in fact, the structure of vinyl chloride/symmetrical dechlorethylene copolymers. Such materials might permit the use of pvc in pipes encountering temperatures as high as 120°C., and this with normal lubricants and stabilizers.

Consideration of such copolymers led the speaker on to the possibilities of block and graft copolymerization based on pvc. The normal problems attendant on these techniques appeared in pvc copolymers but at least one, that grafted with acrylonitrile, looked interesting.

Among other factors affecting the performance of pvc the speaker briefly reviewed our present appreciation of the problem presented by the thermal instability of pvc and the mechanisms through which stabilizers inhibited this breakdown.

Plasticization

T. C. Mooreshead (A. Boake Roberts), who has been working with plasticizers for a long time, gave the symposium some generalizations relating their chemical structure and performance. He called his 'the empirical approach' rather than the thermodynamic one, but it will prove none the less useful for that. He was concerned to explain why a given material acted as a good or bad plasticizer and even better, to predict how it would behave.

His ideas turned mainly on dipole interaction between the plasticizer and the pvc polymer. The latter consisted of chains containing a series of dipoles due to the electrical assymetry introduced by the chlorine. These had a considerable cohesive effect as between adjacent chains, thus reducing the flow, flexibility and workability of the plastic. The plasticizer, which improved all these characteristics, did so by reducing the dipole attraction between the chains.

How did it do this? The plasticizer, he said, was itself a polar entity and if its dielectric constant, which was a measure of the dipole situation, lay outside the range 4—8, it would not be a good plasticizer for pvc. It was a matter of interaction between the dipoles of the plasticizer and the polymer. If the cohesive force between the polymer chains was much greater than that between chain and plasticizer the latter would be squeezed out. Equally if cohesion between plasticizer molecules was bigger, then again they would separate out. In either case the materials would be incompatible. Only when the dipole relationship and thus the cohesion was of the right order, would the pvc and plasticizer mix and stay mixed.

Mr Mooreshead then discussed what features of the plasticizer contributed to the necessary dipole balance. In the first place, a dielectric constant of between 4—8 corresponded to one polar group to every 6—14 carbon atoms. This circumscribed the likely materials.

Chemical Types

The polar groups might vary in their nature and frequency. The commonest groups in pvc plasticizers were the carboxylic acid esters, and those of inorganic oxy-acids, such as the phthalates and phosphates respectively. The epoxy group was also useful. But while the type of dipole was of the greatest interest, the rest of the molecule was also important. Thus it might be an aliphatic chain, an aromatic ring, or both, which profoundly influenced the performance of the plasticizer. The speaker classified plasticizers into six groups according as to which of these three groups they contained, polar, cyclic or aliphatic. The primary sort invariably contained a polar group and a cyclic and possibly an aliphatic group. Secondary plasticizers consisted of a

polar group attached to an aliphatic chain. Without a polar group the molecule could only act as a lubricant or as an extender, that is, it would usefully plasticize only in the presence of a primary plasticizer.

Mr Mooreshead then considered at some length the range of pvc plasticizers and their properties in terms of the foregoing structural considerations. He concluded by saying that he could not foresee the discovery for single chemical structure to suit all occasions. He said 'The problem facing the plasticizer manufacturer is not to seek such a substance, but to find new sources of materials and better processes, which will result in such things as better chemical stability and most of all lower prices'.

Stabilization

In describing the manner in which pvc was thought to break down under the action of heat and light, J. A. Rhys (F. W. Berk and Co. Ltd.) explained that the function of stabilizers was not to prevent degradation, which they could not do. They could, however, affect the rate of decomposition and convert the resulting products to unobjectionable materials.

A good stabilizer must combine a number of features. In addition to the ability to fix free hydrochloric acid and to perform as an antioxidant and ultra-violet radiation absorber, it must be compatible with pvc. It should be easily dispersible in the compound, as well as being free from smell, taste and toxicity. To all this, the ideal material should possess that most important of all properties, cheapness.

In considering which of the many available stabilizers or stabilizer systems was most appropriate for a given compound the conditions of processing were all important. For example, the temperatures to which it would be exposed and the duration of that exposure would depend on whether the compound was to be sheeted through a high or low speed calender, or possibly be subjected to a long or short mixing cycle. This would dictate the choice of stabilizer.

Other factors would also have their influence. The plasticizer had an effect. Fillers made a difference. Whether or not colour could be tolerated had to be taken into account. Service conditions, such as weathering, contact with sulphur or copper, and the tolerability of some toxicity, were also most relevant.

World Wide Pattern

In his analysis of stabilizer usage, Mr Rhys thought that the pattern was essentially similar throughout the world. Lead salts were the most popular and account for between 70 and 80% of the total market in the UK. Next in importance were the barium, cadmium zinc systems. After them, the organo-tin compounds, the epoxy stabilizers and various others.

The chief attraction of the lead salts was their cheapness, particularly when quoted on a weight basis, but they also afforded excellent long term heat stability. The most common lead compound was white lead or basic lead carbonate. Others had more specialist uses, for example tribasic lead sulphate in electricals, dibasic lead phosphate where good light stability was necessary, dibasic lead phthalate for the so-called 105° wire and the new foamed leathercloth.

Barium-cadmium systems were replacing lead in floor-tiles and were being used with epoxy compounds and tertiary phosphite in a single system for calendered sheeting. This avoided sulphur staining and 'plate-out'.

The speaker discussed the changing scene in the field of stabilizer application in the varied field of pvc processing and uses, in some detail.

PVC/Rubber Blends

J. E. Bramfitt and J. M. Heaps (BX Plastics Ltd.) were co-authors of a paper on pvc/rubber blends, read by Dr Heaps who dealt in some detail with the mechanisms that might account for the toughening of pvc which was observed with the admixture of 5-10% of a suitable rubber.

The 'brittle' behaviour of unplasticized pvc in response to a rapidly applied stress was thought to be due to the formation of micro-cracks at the surface and their propagation in a plane perpendicular to the direction of maximum tensile stress. These cracks were encouraged by surface defects and stress concentrations.

Since it was difficult to envisage the elimination of conditions favouring initiation, the polymer might be toughened by increasing the amount of energy required to develop, or propagate, the crack. This was reckoned to be the main function of the rubber in a toughened composition.

Adhesion Problems

To perform effectively, the rubber must be present as a separate phase of discreet particles which had an optimum size of about one micron. Other requirements, in addition to incompatibility, must also be met. There should be good adhesion between the two phases and the rubber should be tough. Thus the problem of obtaining incompatible rubbers capable of being dispersed as particles which could adhere well to the pvc was the key to obtaining a satisfactory rubber toughened composition.

Choice of Rubber

Dr Heaps considered the choice of rubbers from a theoretical standpoint. He thought, though with some reservations, that the so-called 'solubility parameter' δ could be used as a means of deciding which were the most suitable rubbers to blend with the pvc. He classified them into compatible, incompatible and semi-incompatible varieties, from numerical values for the solubility parameter and selected the last group as the most suitable. Such rubbers could, at the maximum, increase the impact strength of rigid by a factor of 10.

Turning to the compounding and processing of toughened pvc, the speaker said that this was essentially similar to that of pvc itself. The usual compounding ingredients were necessary with the addition of a rubber antioxidant. This latter, however, must not be of the amine type, since these accelerated the thermal decomposition of the polymer. In processing it should be remembered that a too expensive mechanical treatment as in milling, broke the particle size of the rubber down too far with a consequent fall in the impact strength of the blend.

Choice of polymer was important. High molecular weight material (greater than K value 65) was preferred, while emulsion pvc, for a reason as yet unknown, gave better products.

Compounding Techniques

G. A. R. Matthews (I.C.I. Plastics Division) felt that pvc compounding was more of an art than a science, since theoretical understanding of the underlying processing lagged, as yet, far behind practice. Perhaps this was understandable in view of the complex nature of the events which occurred during compounding.

He listed some of the individual changes which contributed to overall process; simple mechanical admixture of solid and liquid components, molecular admixture in the solvation of the polymer by plasticizer, thermal plasticization of the resin, adhesion between plasticized resin particles, thermal degradation of the resin and possibly other ingredients and finally mechanical degradation of the polymer.

Thus the art of good compounding was to limit the undesirable develop-

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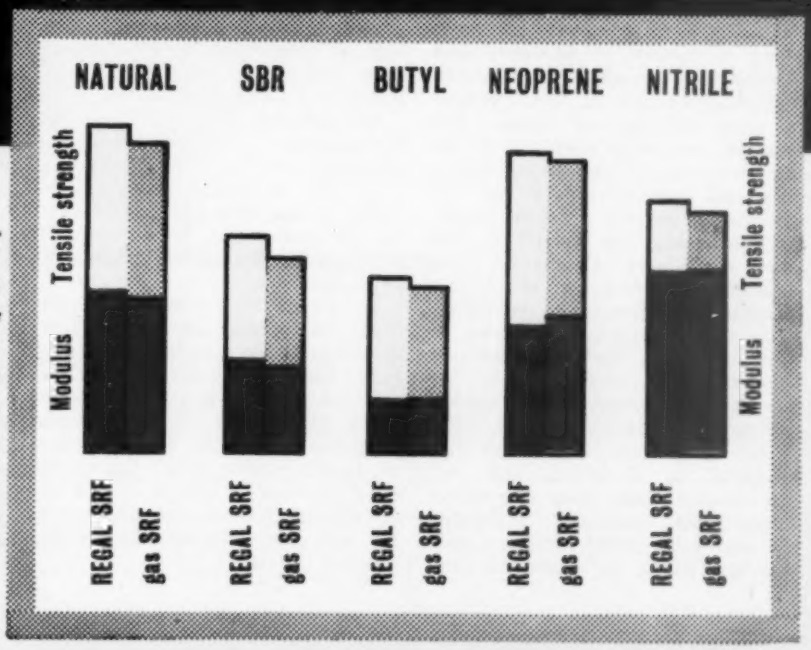

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ments as far as possible and to get the rest occurring in the correct sequence.

The speaker discussed briefly the components that went to make up the final pvc compound, considering specifically their impact on processing. Among other things he pointed out that individual ingredients had effects additional to their primary purpose. For example, some stabilizers acted as lubricants and their inclusion would require the amount of lubricant added to be adjusted. Pigments would often adversely affect the electrical properties of the compound and might lead to 'streaking' and 'plate-out', as well as to the anticipated colouring.

Cost Reduction

Fillers too must be considered carefully for their unwanted effects. Their main purpose was to reduce cost and sometimes, as in the case of floor tiles, it would be more accurate to consider the resin as a binder for the asbestos rather than for the mineral to be regarded as a filler. Fillers generally had deleterious effects on properties and processing behaviour and it was advisable not to push cost considerations too far.

The influence of contamination should be appreciated, particularly in electrical materials. Mr Matthews gave a striking illustration of this in a compound of granular polymer contaminated with 0.25% of emulsion pvc. The volume of resistivity was reduced by about 40%. If 1% of emulsion pvc found its way into the compound the resistivity was not much more than one-tenth of the original value.

The compounding of the raw materials to the final product could be effected in a number of ways, using a variety of processes and machines. The speaker considered the different routes that might be used to make the required change. For example, one might choose to go via the ribbon blender, the internal mixer, mill and granulator. This was the traditional method. Other, newer, techniques had been worked out and were being used. Continuous compounding on various types of modified extenders was growing in popularity. The use of high-speed mixers to produce freely flowing plasticized powders which could then be fed directly for extrusion was another important line of development.

Mr Matthews then took his audience on a critical and well documented 'Cooks Tour' of available compounding machinery. He finished his survey by gazing into his crystal ball and telling his audience a little of what he saw therein. At least that part relating to possible future developments in compounding techniques.

Extrusion Trends

The first thought of A. Kennaway (BTR Industries Ltd.) in his lecture on trends in pvc extrusion was that pvc was not one but a range of materials and the processor must bear this in mind if he was to get the best results. But the form as well as the nature of the compound must be taken into account. When dry blends of a small particle size and low bulk density were used, less material was passed forward per turn of the screw. The danger of trapping particles between the screw flights and the barrel therefore demanded low shear rates and thus low screw speeds. Hence the need for a long screw at least 24:1 ratio and metering section with a channel depth corresponding to 4:1 compression ratio. These characteristics were applicable to screws of 2½in.-3½in. diameter. With such a dry blend, a devolatizing section was useful to vent to moisture picked up by the powder.

By contrast, fully compounded and granulated material could be processed with much shorter screws with an L/D ratio of 16:1. Between these two extruder feeds lay the compound produced by the high speed mixers. This demanded a screw with a 20:1 L/D ratio and 2½:1 compression ratio.

Streamlined Polymer Flow

The main enemy in processing pvc was overheating and consequent degradation but the correct conditions could be found. The speaker recalled that he had extruded sheet from a dry powder mix of unplasticized pvc of high K value with a slow turning screw and constant pitch and depth and a 16:1 L/D ratio.

On materials of construction, Mr Kennaway recommended flame hardened screws such as Nitraloy but found that chromium plated screws tended to lose their plating especially on the small radii. Barrel materials can be made of high boron cast iron or nitrided steel.

In dealing with principles of die design the speaker stressed not only the need to avoid dead spots by stream lining but also to make sure that the cross section area of the channels in which the polymer would flow, was progressively reduced from the end of the screw helix to the lips of the die itself. Further, enough space must be allowed between the spider and the die exit to allow the molten polymer to relax.

The often discussed comparison between single and twin screw extruders was touched on. The latter provided a positive pumping action and thereby reduced the chance of variable and extended dwell time. This made for less critical operation. In fact, he said, 'if we are prepared to accept low outputs and high capital cost of twin screw machines, we can get excellent production at a lower level of technical skill than with the single screw machine'.

Mr Kennaway then turned to various forms of extruded pvc. Layflat unplasticized film could be made in thicknesses from 0.0025-0.005in. in high transparency and sparkle. Layflat highly plasticized pvc could also be made in similar thicknesses. For narrower widths, as for sachets, the quenching operation limited output but water quenching helped quite dramatically.

Sheet could be extruded either through a T bar or circular orifice with slitting at the die face. The speaker thought the latter technique was preferable. For the extrusion of pipe good haul-off equipment was essential and the caterpillar type was now deservedly coming into common use.

Sintering Processes

Among the newer applications of pvc, its use as a surface coating material is attracting attention. It has been applied to the substrate as a solution, as a plastisol and sheet is being laminated with metal, but the method discussed by W. Adams (Vinatex Ltd.) involved the use of so-called sintering powders. These were melted on to the article to be coated and the adherent pvc particles were fused to form a solid homogeneous coat.

The technique was not limited to pvc. It was finding increasing application with polythene, cellulose esters and other plastics, but pvc did have advantages in that among other things it was cheap and could be produced in varying flexibility.

Pvc sintering powders could be prepared in a number of ways. Perhaps the most interesting made use of the temperature of liquid nitrogen (−195°C.). This took the pvc well below its brittle point thus reducing its impact strength or toughness to make comminution relatively easy. If ambient temperatures were used, then grinding produced a shredded material with a rather different particle shape and size distribution. Dry blended powders made in high speed mixers were also being used.

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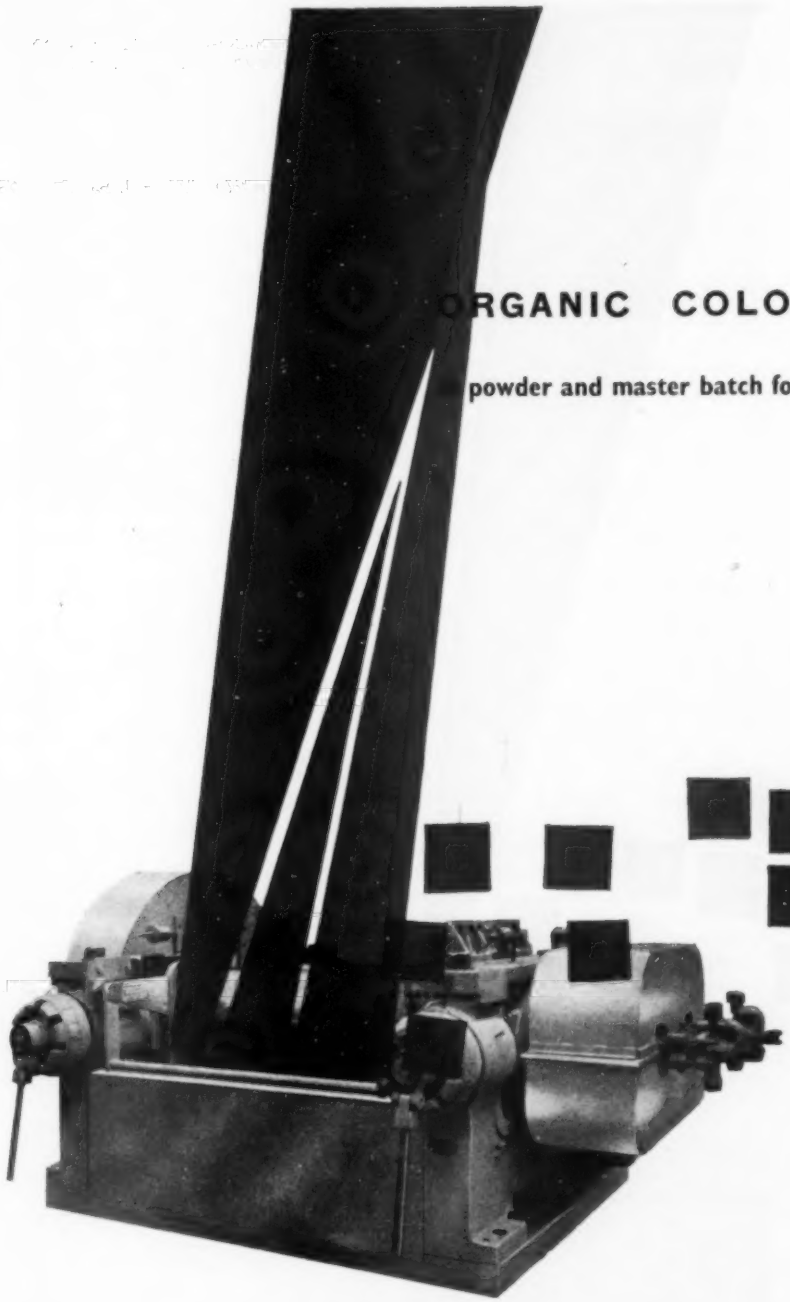

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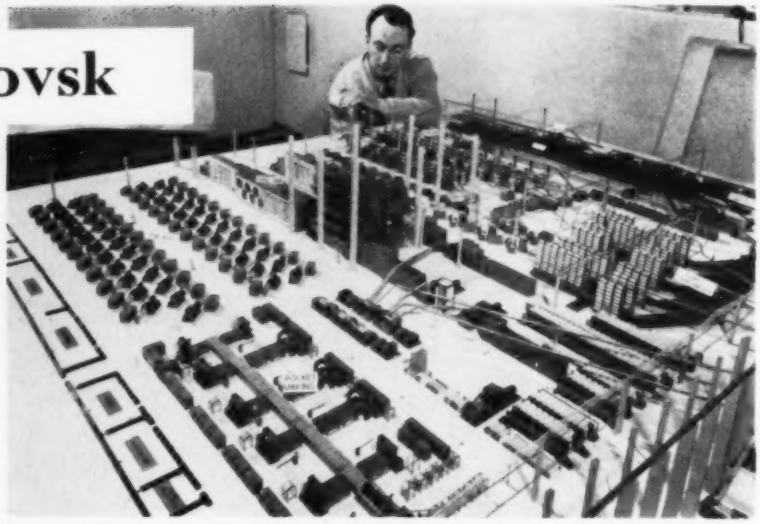


Part of a model of the Russian plant, depicting equipment supplied by Rustyfa

ONE of the largest and most completely mechanized tyre factories in Europe, which has absorbed about £14m. worth of engineering service plant and rubber and tyre manufacturing machinery supplied from the UK, will shortly be going into production at Dneipropetrovsk, near the Dneiper River in the Ukraine. The plant has been supplied by the consortium Rustyfa Ltd. (Member companies of the consortium are: Mather and Platt Ltd., Simon Handling Engineers Ltd., Crompton Parkinson Ltd., David Bridge and Co. Ltd., Francis Shaw and Co. Ltd., and Lancashire Dynamo Holdings Ltd.)

The factory has been laid out and equipped according to specifications recommended by Dunlop Advisory Service Ltd., who are consultants to the consortium. This company is also responsible for supervising plant and machinery during course of manufacture and for inspection before despatch.

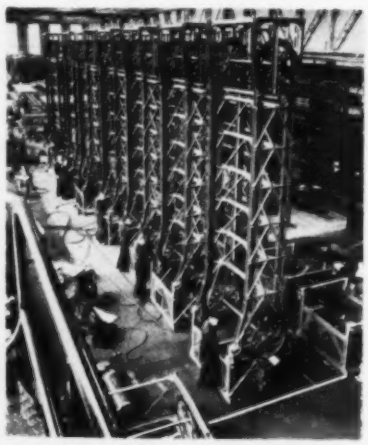
The design and layout of the plant is arranged to give a continuous and directional flow of work through the various processes; it is fully mechanized with a high degree of automation. The planning and provision of the various mechanical handling and conveying systems was undertaken by Geo. W. King Ltd., in close co-operation with Dunlop Advisory Service Ltd.

Wide Range of Tyres

The factory, built on a 79-acre site, has been designed to produce 2m. tyres per year ranging in size from the small car tyre to the tractor and giant earthmover types. This wide range presented the designers with one of the most difficult problems from the handling aspect.

The manufacturing building is approximately 1,170ft. long by 570ft. wide with a three storey section giving a total floor area of 765,000 sq. ft. An administrative office block is situated alongside one end of the manufacturing building, the first floor being connected by bridgeways. Ancilliary buildings include tyre test house, research laboratory, maintenance machine shop, and houses for compressed air plant, water pumps and electrical switch gear. A separate building, having a total floor area of 326,000 sq. ft. has been constructed to one side of the main manufacturing building to accommodate raw materials and finished tyres awaiting despatch.

Raw material is conveyed into the manufacturing building via bridgeways. Fabric rolls are brought directly to the centre of the plant, while raw rubber is delivered to the beginning of the manufacturing process at the extreme end of the building. Fabric rolls, each weighing half a ton, are conveyed at a rate of 12 an hour to the fabric lines by a semi-automatic overhead runway, which is in the form of a closed circuit incorporating five all-electric twin lift King Marvex hoists.



Powered vertical storage racks for rolls of ply material under construction and test at the Stevenage works of G. W. King Ltd.

The fabric rolls are attached by slings at a loading station in the stores. By a pre-selector switch the operator is able to direct the hoist to any one of three unloading stations in the manufacturing building. To ensure regular spacing of the units and to prevent them from approaching each other beyond the minimum distance, the electrical supply busbars are broken for a section between each station. This section becomes dead when the station in front is occupied.

Depolymerization Plant

Natural and synthetic rubber is brought into the manufacturing building by an overhead conveyor system. The rate of flow for both natural and synthetic bales is approximately 10 tons per hour.

The bales are conveyed in basket type carriers, designed to hold two bales of natural rubber, or six bales of synthetic.

The carriers are despatched by pushbutton pre-selection to one of four unloading stations, the natural rubber first being directed to a depolymerization plant, where electrical treatment brings it to the temperature required for processing.

At each unloading point, conveyor loops are provided with a number of waiting indexers; it is therefore possible to send a batch of bales of any type of rubber and the whole batch is received before any work is begun on them. As empty carriers leave the unloading loops the pre-selection peg is cancelled and they are returned to the stores building for re-loading.

Air operated rams are used at all unloading stations to push the bales clear of the carrier. At the two bale

cutting machine stations, air operated turnover frames are provided which turn the bales on edge ready for cutting. At the two pelletizing machine stations, auxiliary belt and powered roller conveyors take the bales to the hopper of the machine.

Fabric Storage

After the various fabrics have been treated on two process lines and passed through calenders for rubber topping, they are rolled with fabric liners inserted for protection. They are then conveyed to stock racks from where they are called as required. Passing the rolls, each weighing 25cwt., from the two fabric lines to any of eight storage racks at approximately 28 rolls per hour, involves a complicated system of cross-over lines and junctions.

A semi-automatic overhead runway forms the basis of the system, with three King Mammoth hoists allocated to each of the two fabric lines. Operators at the two pick-up points select a storage rack to which the roll is to be sent by press button control. The hoisting units themselves are controlled from pushbutton panels suspended by power driven cable drums attached to the hoists.

Incorporated in the runway is a main junction directing the hoists to three principal tracks where they are further divided to cover all the storage racks. All hoisting units are returned through a by-pass route to one point where liners used in the rolling are picked up and taken to the end of the topped fabric line.

The rolls are removed from the storage racks and delivered to six bias cutting machines by a semi-automatic runway on which are mounted four specially designed double hoisting units.

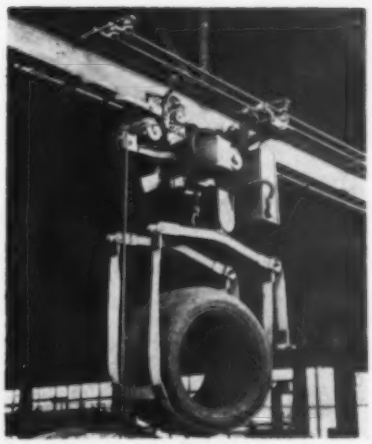
After passing through the bias cutting machines, the material is batched in smaller rolls of ply material, and stored in powered vertical storage racks. There are 60 racks, one for each type of ply material.

The racks, designed to hold 18 rolls at 224lb. each, consist of two endless lengths of heavy duty bushed roller chain fitted with specially shaped attachments to receive the fabric roll box ends. Each rack is driven through reduction gearing by a 3hp motor chain coupled to a sprocket on the head shaft. When a roll is fitted the sprocket revolves elevating the chain and so bringing the next vacant attachment into position.

Tyre Building

The ply rolls are delivered to band building and single ply tyre building machines by a King Dual Duty light type overhead conveyor. Any combination of the 60 different types of rolls held in storage may be required at any of the tyre building machines.

After loading, the carriers begin circulating around one of two tyre building area conveyors according to whether the material is for single ply machines or band building machines. An auxiliary unloading loop is provided at each tyre building machine to hold one carrier at a time. When a service operator requires a roll of material he uses a selector switch and pushbuttons mounted adjacent to the unloading loop. This sends a call to an electrical peg setting unit mounted on the circulating conveyor. The next carrier with the required material to pass through this unit is automatically directed on to the machine loop from which the call was made. If no call is made for a material it will continue circulating around the tyre building area.



Semi-automatic overhead runway system with electric blocks for take-away of green covers from the band building machines. The special adjustable sling is shown

On arrival at a machine the operator removes the new roll from the carrier and, using auxiliary handling equipment, places it on a rotary storage unit. An empty liner is then put into the carrier which is called back into the circulating conveyor, and returned to one of the liner batch-up conveyor lines where the liners are removed and re-used.

Empty carriers leave the liner conveyors and, continuing in the Dual Duty conveyor system, transfer to the correct loading conveyor. Each empty carrier must reach the auxiliary loading loop adjacent to the storage rack holding the type of material allocated to it. This is achieved by the use of 'homing' pegs, which allow complete flexibility of movement in the storage area.

The treads are brought to the tyre building machines by an overhead belt conveyor system incorporating vertical hugger belts. This system comprises four different conveyors feeding the four lines of tyre building machines. Each line consists of an adjustable inclined section, a fixed inclined section and an overhead horizontal set of conveyors spanning the machines. Above each machine a short length of hinged roller conveyor is arranged, feeding into the vertical hugger belts leading down to the machine table.

Each vertical hugger belt unit is so positioned that upon demand by the machine the hinged roller section will lower and the tread held on the adjacent horizontal conveyor passed down to the machine table. Upon

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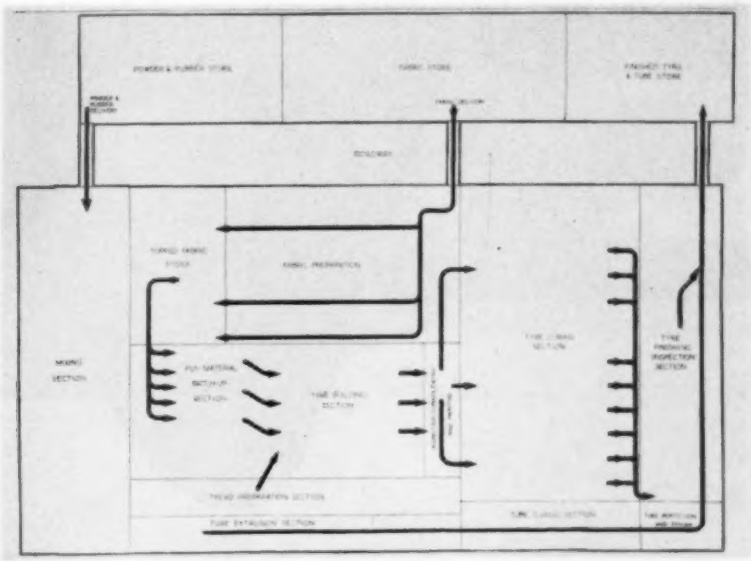
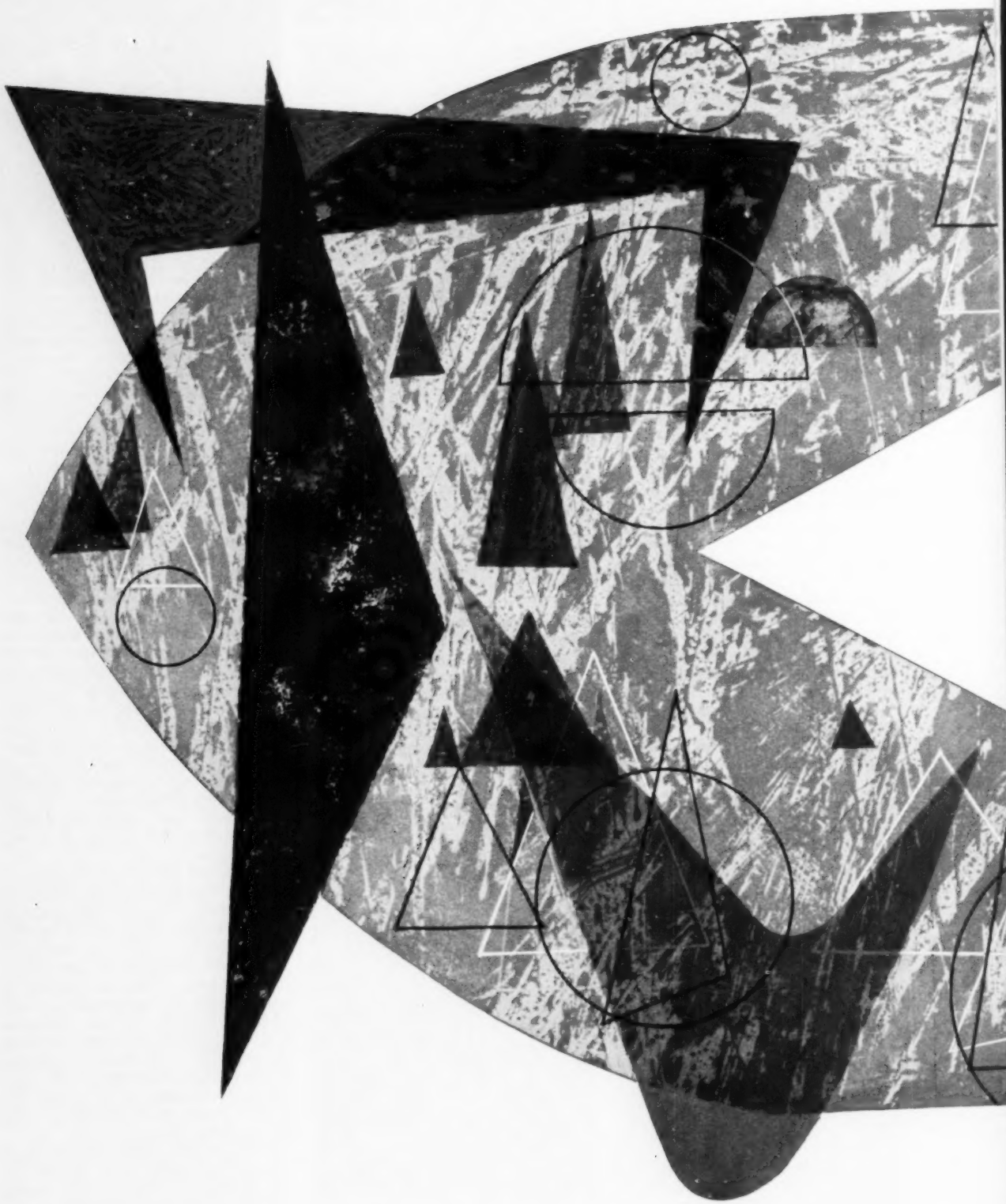


Flow diagram of the Dneipropetrovsk tyre plant



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VIEWS and REVIEWS

THE February 1961 issue of the Transactions of the Plastics Institute (Vol. 29, No. 79) has four papers, all of more than usual interest and value.

Poisonous Plastics

It is the ordinary word which condemns, and the genteel one which excuses. 'Poisonous Plastics' sounds far worse than 'Toxicity of Plastics', which is the first of the four papers in the PI Transactions. It is by P. P. Hopf of Boake, Roberts and Co., and is an excellent survey of an unusual subject.

One of its opening statements is likely to be received with shock, cynicism, or applause, according to temperament. 'The particular importance of the problem of toxicity in plastics is perhaps not so much that acute dangers to the public are likely to arise as that it forms a dangerous platform for adverse publicity'. This not very carefully worded phrase could be taken to mean that private business is to be considered before public safety, welfare, and even life itself! Concede that the author means that unscrupulous opponents of plastics, jealous of the progress being made, could use the real or imaginary hazards of poisoning to cripple the industry, and then his plea for vigilance, for profiting by the experience of other countries, for the careful study of the practical implications of proposed safeguards — all these come home forcibly.

Sooner or later, it will be necessary to have common standards, at first in Europe and then throughout the world. An undoubted difficulty is that it is 'universally impossible to express toxicity in units . . . the solution reached is for a committee of experts to fix a universal value for toxicity — a value chosen on an arbitrary scale by weighing all the factors brought into play by toxicological tests'.

Under the auspices of the DSIR, there has been formed a British Industrial Biological Research Association 'to collect and disseminate toxicological data on materials which may enter foodstuffs, either as deliberate additions or adventitiously from the package'. From its inception, this Research Association has been supported by the plastics industry in Great Britain.

Standards of Toxicity

The Toxicity Sub-Committee of the Technical Committee of the British Plastics Federation has also done valuable work, not the least in setting up general principles for standards, such as that no plastics materials need be considered except when put to the normal use intended by the manufacturer or seller, from which it follows that 'we are concerned with trace amounts only, *i.e.* with substances which may be transferred from the plastic to the foodstuff and yet leave the plastic serviceable and the food not unpalatable'.

It also follows that 'standards of toxicity need only apply to plastics component materials which have a physiological action and which are liable to leach out in measurable quantities'.

Mr Hopf discusses foreign systems of legislation in this field, the British system, and the official reports which have been made on colours, antioxidants, and preservatives. He shows that much depends on 'complete and frank co-operation between supplier and user (from the stage of raw materials to that of the finished package)' and he claims it to be 'a fair decision that the chemical manufacturer should be responsible for the standard of his component materials, and the plastics fabricator for the standard of his final product'.

I hope I have indicated that Mr Hopf deals with the general legislative principles and illustrates them aptly with good technical examples. It is not only a useful and informative paper but an interesting one to read.

Reinforced Plastics

The second paper in the February 1961 issue of the Transactions of the Plastics Institute is by L. H. Vaughan of Bakelite Ltd. on 'Progress in Reinforced Plastics', a review of the big developments made since he last presented a paper on the subject to the PI some seven years ago.

He wisely defines and limits his field to those reinforced plastics 'which are moulded or laminated from fibrous materials, such as glass fibre, and a synthetic resin, at relatively low moulding pressures, *i.e.* below 200psi, and which function primarily as structural or semi-structural materials because of their high strength-to-weight ratio'.

The most important resins used in this field are, of course, polyester resins and epoxide resins.

Polyester resins are the most widely used because they are cheap and are readily processed. There are several kinds of them, each intended for its special purpose or having a special cost. Mr Vaughan discusses in detail three relatively new groups: the isophthalate polyester resins, pre-accelerated resins and resins having 'built in' accelerators, and polyester resins made from hydrogenated bisphenol A and similar compounds.

Resin Developments

He shows that the isophthalate polyester resins give laminates which have much better resistance to weather and to boiling water than do those made from the orthophthalate.

There is now a substantial demand for pre-accelerated polyester resins (*i.e.* containing the cobalt accelerator) into which the user mixes the appropriate amount of hydroperoxide catalyst. The process of laying down a deposit by spraying simultaneously the liquid resins and the (chopped) glass-fibre has also brought into use a resin pre-accelerated by a redox system, a tertiary amine such as dimethyl aniline plus a peroxide such as benzoyl peroxide. A further development is the polyester resin which has chemically-combined tertiary amine groups which act as a 'built-in' accelerator, and give a resin which is stable for several months at room temperature. By using this type mixed with a resin plus peroxide, which is stable for days, there is no danger of premature gelation during spraying.

After an outline of new trends in epoxide resin chemis-

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by **F. C. JENNINGS**

try, Mr Vaughan discusses reinforcing materials, mainly glass-fibres.

Reinforcers

Because it seems that the mechanical strength of a glass-fibre laminate depends basically upon the adhesion between fibre and resin, and that this adhesion is not very good with glass-fibre, there have been developments in the application of finishes to the fibre. Definite improvements can be obtained, although the mechanism is still a matter of speculation. Recent developments in reinforcing materials include woven shapes, high-temperature resistant yarns (for rockets), glass rovings, and overlays of synthetic fibres.

In a useful final section, the author surveys some of the causes of variability and the possibilities of control. Unfortunately the engineer still cannot get reliable data for his purposes but the British Plastics Federation, realizing that this is a hindrance to the commercial development of reinforced plastics, has set up a technical committee to study the situation. The results of its labours will be looked for with interest.

Automobile Plastics

A. C. Hill, senior development engineer of the Pressed Steel Co., has written the third paper in the February 1961 issue of the Transactions of the Plastics Institute, on 'Automobile Research and Plastics'.

A timid car-owner could lie awake at nights fearing his car would break down because it consists, even in its simplest form, of such a large and varied collection of component parts. To the plastics industry this wide variety is at once a challenge and an inspiration.

As a consumer of the products he designs, I would like to debate with Mr Hill on his statement that changes in motor-car design are 'essential at certain stages to promote continued appeal to the user', but this is not the place to do it. Instead I take it as an observable fact that such changes are made regularly and consistently by the motor-car designer. 'One aspect of thinking is that people soon become tired of the same article and take the view that any change indicates progress, the latest being the best. This situation particularly applies to a motor-car trim which is usually changed in style on popular models at intervals of 12 months through the overall life of the model, covering three to four years'. At any rate, we can say that this situation is good for the plastics industry.

Mouldings Large and Small

Much time and money has been expended on the application of plastics of all types to cars. One which rightly gets high praise from Mr Hill is the reinforced-plastics car body of the Chevrolet 'Corvette'. Dough-moulded heater-ducts and engine covers using sisal or sisal-glass reinforcement have found favour because of their short curing time.

For vacuum-formed or moulded components, for seat base shrouds, fascia panels, glove boxes, window surrounds, and so on, it is likely that polypropylene will be found to be best from all points of view; polythene, pvc, ABS, all have either technical or economic drawbacks. Nylon, polycarbonates, polyacetals have special applications, *e.g.* in gears.

An interesting use of plastics is for prototype models of complicated automobile body constructions which can be used to study assembly procedures, shop operations, and tooling problems.

The paper discusses the die-moulding of large parts *e.g.* seat pans or even body shells from reinforced laminates, and also the construction of such items by cold-setting methods. It ends with an account of the dielectric welding of decorative door-pads and of crash-pads made with an interior of cellular polyurethane foamed *in situ*.

Propylene Plastics

The fourth paper in this journal is 'The Properties and Processing of Polypropylene' by C. D. Wells and G. J. Nichols of the Shell Chemical Co.

The first characteristic of importance in polypropylene is the degree of isotacticity which influences crystallinity, brittleness, stiffness, softening point, shrinkage, creep, and other properties. Its molecular weight influences impact strength, elongation at break, melt fluidity, and melt elasticity. A compromise is usually chosen between higher physical properties and ease of processing. The paper gives a useful table of the physical properties of several polythenes and two polypropylenes.

The remainder, which is the main bulk of the paper, deals with polypropylene pipe, injection-moulded articles, cables, film, monofilament, bottle-blowing, and sheet.

I particularly like the last section of the paper, 'Summary of Applications', which enumerates the main properties of polypropylene (high rigidity and surface gloss, good strength and surface hardness, good heat resistance which means safe sterilization, good electrical properties, good dimensional stability, ease of colouring, ease of processing on conventional machinery) and then the potential applications arising from these properties (toys, domestic articles, industrial mouldings, bottles and other containers, monofilaments for ropes, nets, textiles, clear film for wrappings and packaging, pipes and fittings, sheet for vacuum-forming and for fabricating constructional units, electrical applications, surgical items).

Bearing in mind that this paper was originally read to the Yorkshire Section of the Plastics Institute as long ago as November 1959, it is still quite informative.

Co-ordination of Conferences

With the Transactions of the Plastics Institute appears also its journal, which is mainly concerned with news and announcements. It contains the best summary of the dates, places, and subjects of forthcoming conferences that I have seen. I should add that I felt that the list of projected conferences is again growing ominously, and if to those given here be added others proposed in various European countries for the next year or two, much weight is added to the growing demand for more co-ordination, if not control, at an international level.

If the multiplication of polymer conferences continues at its present rate, there will soon be no 'customers' for them; we shall all have died in aeroplanes, trains, buses, cars, hotels, from the fatigue of dashing from one conference to the next, or from the ennui of listening to endlessly repetitive lectures.

CHARLES JENNINGS

MEN *and* MATTERS

A Review of People and Events

by Peter Richards

AN enormous polythene bag has appeared in Downing Street. It is being used as a temporary weather-proof structure during reconstruction. The Downing Street rebuilding scheme includes the reconstruction of number 12 to its original height. It was reduced by a fire in 1879.

To avoid the risk of delays due to bad weather, the contractors have erected a temporary structure over the site of number 12 and covered it with 1,000 gauge Visqueen polythene building sheet. They clipped boards to the scaffold poles and secured the polythene sheeting by trapping it between the boards and timber battening nailed through from the outside. In this way, full time working was assured under reasonable conditions, resulting in raised productivity and output per man.

The complete enclosure, which will be in position for several months, was approximately 65ft. x 70ft. x 35ft. high and cost only a few hundred pounds including all the scaffolding, timber, polythene film, and the labour involved. In addition, the transparent sheeting eliminated the need for extensive internal lighting which would have been required if more conventional cladding materials had been used.

The polythene film was also made up into panels and employed as temporary glazing over the window spaces of number 10.

£3,776 Worth of Ideas

Thinking costs nothing — but it may pay a lot. Bright ideas at Fort Dunlop last year were worth £3,776. This was the money paid out for 2,461 ideas put into the firm's suggestion scheme. A comparatively high percentage of these ideas — nearly 5% — were taken up.

The highest individual awards were for an improvement to a tyre fitting machine, which paid £125, and for a better method of lettering tyre sidewalls for which £100 was awarded.

The City of London Livery Club presents a trophy and certificate to the department that tops the suggestion league. This time it was won by the apprentices (picture below).

Gin and pvc

It's gin and pvc (high impact) at the new Brentford bottling warehouse of Booth's Distilleries Ltd. The plastic is playing an important part in the preparation of gin for bottles.

Two-inch (od) pvc pipe is used to carry compressed air to stainless steel 'air rousing' equipment fitted in the interior of each of 16 glass-lined vessels. High strength gin is put into the vessels for blending and reducing to bottling strength, and the compressed air is used for 'rousing' the contents to ensure complete blending and marrying of the gin.

The pipe used was extruded from British Geon's RA 170 high-impact pvc compound by the corrosion engineering section of BTR Industries Ltd.

Henry Knott (*left*)**, apprentice training officer, and apprentice P. Naylor receiving the Livery Trophy and Certificate on behalf of the Fort Dunlop apprentices from works director Eric Quinton. The apprentices came top in Fort Dunlop's 1960 'suggestion league'** (*see: £3,776 Worth of Ideas*)

The new BRP technical manual No. 12, entitled Cellobond Polyester Resins, a review of which appears on page 589, was largely the work of K. A. Scott (*left*) **and J. Macoustra**

Dunlop Promotions

D. J. Flunder, general purchasing manager of the Dunlop Group for the past two years, is to become general manager of the chemical products division in Birmingham. Mr Flunder will succeed N. G. Bassett Smith, who is to become general manager of the Dunlop Footwear Co. at Walton, Liverpool.

Mr Flunder, who is 38, joined Dunlop in 1946 as an assistant in the plantations company. During the war he served in the Royal Marines, finishing as a major.

Mr Bassett Smith joined Dunlop in 1927, and in 1939 was appointed manager, rubber wing division. He returned from the Army with the rank of Lt.-Col., was appointed sales manager of the compositions division and, in 1957, general manager. (The compositions division was renamed the chemical products division in 1960.) Mr Bassett Smith is chairman of the British Rubber and Resin Adhesive Manufacturers Association and a council member of the Federation of British Rubber and Allied Manufacturers.

New Vitafoam Directors

Two new appointments to the board of directors of Vitafoam Ltd. are those of J. Cheetham and G. Kelly.

Mr Cheetham joined Vitafoam in 1956 as a representative, became upholstery sales manager and then general manager of the upholstery division, of which he is now the director. He has 27 years' previous experience in the rubber industry, 17 of them with Redfern's Rubber

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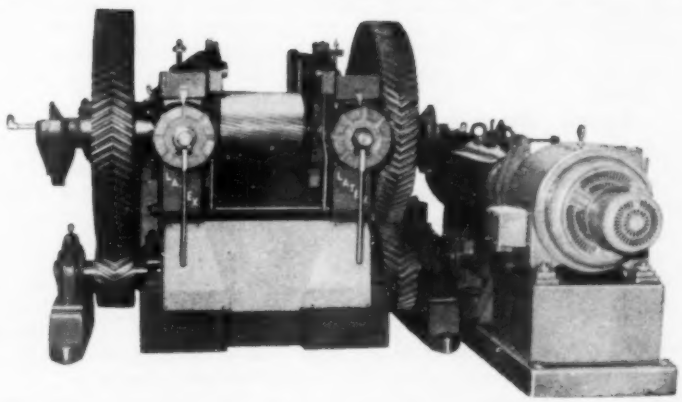

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Works Ltd., and ten with Latafoam Ltd.

Mr Kelly, director of the retail division, was the managing director of Genefoam Ltd., which he founded in 1947 as the Liverpool Latex Cushion Co., and was previously managing director of Gerrard Kelly Ltd., a Liverpool home furnishing firm.

D. J. Liston, as the chairman of the British Plastics Federation's new packaging group (*RPW* April 8, 534), has been elected to the Federation's council

Fablon Appointments

Four new appointments recently announced by Fablon Ltd. are those of C. G. Bevan as marketing manager, A. J. Munn as home sales manager, G. D. Summers as assistant sales manager, consumer products, and A. E. Skipper as assistant sales manager, building and industrial products.

Successor for Dr Beeching

Mr Harold Smith, chairman of I.C.I. General Chemicals Division for the past two years, has been appointed a director of I.C.I. with effect from March 23. He will take over as technical director from Dr Richard Beeching when the latter takes up his new appointment as chairman of the British Transport Board on June 1.

Mr Smith has been with I.C.I. since 1929 and until 1957 was with the Dyestuffs Division of which he was joint managing director. He has also been chairman of Plant Protection Ltd. and a member of the board of the I.C.I. subsidiary company in America, Arnold Hoffman Inc.

Flooring at Sea

Flooring orders made recently include many placed for the new P and O liner *Canberra*. Both Phoenix Rubber and Runnymede Rubber have received extensive contracts.

The *Empress of Canada* sails from Liverpool on her maiden voyage on April 24. She will carry 117,054 sq. ft. of decking and decorative floor finishes supplied and laid by Semtex. This contract comes hard on the heels of the order for 322,000 sq. ft. which Semtex recently completed aboard the *Oriana*.

Appointments in Brief

Arthur Kelly, executive vice-president of B. F. Goodrich Co., has been elected to the board of directors. During the Second World War Mr Kelly was responsible for the construction of government-financed synthetic rubber facilities in Kentucky and Texas.

* * *

E. T. Handley has been made managing director of research for Firestone Tire of Akron. He was formerly executive vice-president of the plastics and synthetic fibres divisions of the company at Pottstown, Pennsylvania.

Polly Ester Says . . .

'Mechanical handler — absent minded rake'

THE LEGAL ANGLE

Trade Marks

By a Barrister

'*Lacron* (807462) *Plastics in liquid form included in Class* 1. *Ronuk Ltd., Portslade, Sussex*'. — *RPW, March* 1961.

A new trade mark for goods manufactured by a distinguished company: one of thousands of new trade names pouring out of the rubber and plastics industries.

Not so long ago we were consulted by a plastics manufacturer who claimed that his product was just as effective as one produced by a company whom we shall call Q Ltd. — and half the price.

'But your cost of manufacture must be about the same?' we enquired.

'Agreed. But they spend millions on advertising and we don't'.

'So . . . ?'

'So we are proposing a small advertising campaign, by advertisement in the Press and by circulars to existing or potential customers, stating that our product is just as good as Q brand plastics and only half the price. But before we do so, we want to find out if there is any legal objection?'

Infringement to Quote

Everyone knows that it is an infringement of someone's trade mark to use it to describe one's own product. If you were to market goods under the name of 'Q Brand Plastics' then obviously Q Ltd. could obtain an injunction, to restrain you from doing so, plus damages, to compensate it, as registered proprietor of the brand name, for any damage suffered. But what is not so obvious, and what few people realize, is that it is also an infringement of a trade mark simply to quote it when making comparisons with one's own product. There was a case in the Court of Appeal in which a manufacturer of a famous chemical successfully restrained a competitor from publishing a circular which named that chemical under its brand name and pointed out that its quality in no way justified its price. The mere use of the other man's registered trade name was itself a breach of the proprietor's rights.

'But I thought that the object of giving the proprietor of a trade mark his rights was to prevent anyone else from passing off other goods as those of the registered proprietor. . . .'

That may be. But on the proper interpretation of the relevant section of the law, it has been decisively established that even if there is no question of passing off, there can still be an infringement of the registered proprietor's rights.

The solution? There seems to be no reason why a manufacturer should not make a favourable comparison between his product and that of another producer, simply by saying: 'Our product is better and cheaper than the equivalent line manufactured by Q Ltd.'. Do not mention the other firm's registered trade name and all will be well.

Electrical Aids in Industry

Data Sheet **No.17**

Canteen Catering

As in every other industry, the main factors governing the economics of the catering business are: quality of product, cost of production, and well-being of workpeople. Electricity measures up well to these three essential factors.

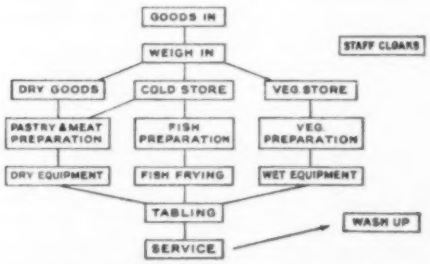
The outstanding virtue of electricity is better cooking, particularly in roasting and pastry ovens where high quality is more easily maintained than in ovens using other forms of heat. The cost of production varies somewhat with the type of food and the size of the establishment, but is usually between $\frac{1}{2}$ and $\frac{3}{4}$ of a unit of electricity per meal. Cleanliness of electric cooking is axiomatic and provides better working conditions for the staff.

The actual size of the kitchen is influenced greatly by its shape and by the number of people catered for, but a rough guide is as follows:

KITCHEN TO DEAL WITH	SIZE
up to 100 persons	5-6 sq. ft. per person
100-250 persons	4-5 sq. ft. per person
250-1000 persons	3-4 sq. ft. per person
over 1000 persons	3 sq. ft. per person

Design

Where the kitchen is designed from the start for the full use of electricity, planning is simplified as the equipment can be placed where it is required without reference to the need for flues.

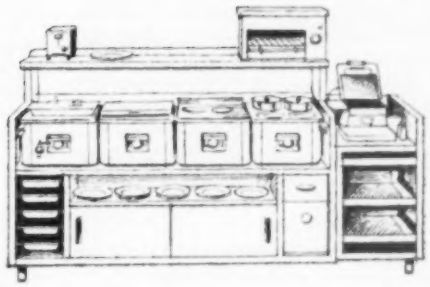


If an existing kitchen is already using other types of cooking equipment, however, electrical equipment can still be introduced item by item to bring increasing benefits.

Quick-service Equipment

The popularity of the quick-service establishment where the food is cooked at the service counter in the full view of the customer is steadily growing, and this type of catering can readily be provided in the canteen by the installation of a Back Bar cooking unit, installed behind a section of the service counter.

The popularity of the mid-day joint and two vegetables is on the wane and the really up-to-date

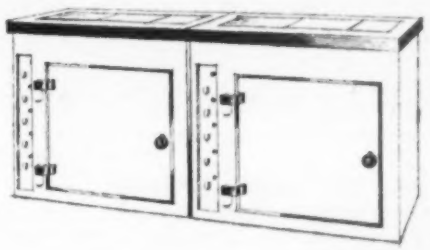


canteen should provide the welcome alternative of fresh food cooked on the spot.

Electric Catering Equipment

Electric catering equipment covers every single kitchen activity and some of the appliances in common use are:

COOKING. Ranges, boiling tables, steaming, roasting and pastry ovens, vegetable boilers, fryers, griller toasters.



SERVICE AND WASHING-UP EQUIPMENT. Bains-marie, hot cupboards, tea and coffee machines, washing-up machines for the larger kitchen and sterilising sinks for the smaller, refrigerated cold-service counter and display cabinets, soda fountains.

PREPARATION. Mixing machines with attachments for chopping and mincing etc., potato peeler, slicing machine.

QUICK-SERVICE EQUIPMENT. Infra-red (contact) grill, automatic toaster, griddle plate, automatic fryer, boiling plates, soup heaters, etc., and, of course, the indispensable refrigerator.

For further information, get in touch with your Electricity Board or write direct to the Electrical Development Association, 2 Savoy Hill, London, W.C.2.

Excellent reference books on the industrial and commercial uses of electricity are available—" Electric Commercial Catering Handbook " (5/-, or 5/6 post free) is an example.

E.D.A. also have available on free loan in the United Kingdom a series of films on the industrial uses of electricity, including commercial catering. Ask for a catalogue.

12799

CUT HERE

DNEIPROPETROVSK

Continued from page 575

discharge, a limit switch at the lower end of the unit is operated and the hinged roller section returned to the horizontal.

As the treads are 'called' into the tyre building machines, the appropriate overhead belts automatically re-start to feed forward the following treads and fill up all vacant positions.

Tyre Removal

Green tyres from the truck and car tyre building section are removed by an overhead monorail conveyor equipped with saddle type carriers at regular pitch. Loading is by hand, the conveyor passing at a low level between the rows of machines. An automatically operated unloading table is provided at the inspection bay.

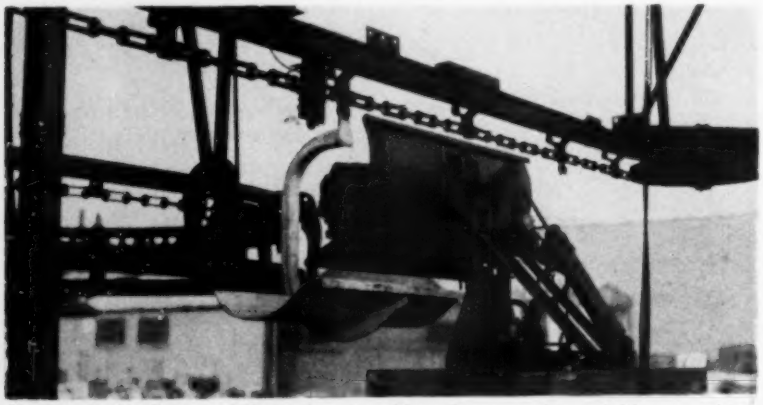
For larger types a semi-automatic runway system is provided incorporating six hoists. These normally travel automatically around a complete circuit in one direction, stopping only at the unloading point. When an operator is ready to load a tyre he uses a pushbutton suspended from the runway by his machine. This causes the next hoist block to stop at his machine. When a block stops at any station the section of busbars immediately behind will become dead so that any following block must also stop.

Tyres for Curing

Delivery of the green tyres from the inspection and painting area to the curing presses is carried out by three separate overhead conveyor systems. Two overhead monorail conveyors deliver the truck and car tyres to 40in. and 55in. presses, while the heavy duty tyres destined for the 75in. presses are handled by a King Dual Duty conveyor.

The presses are arranged in rows back to back, with the overhead delivery conveyor passing between them. Each twin press has its own feeder conveyor, which consists of a fabricated tubular steel frame, mounting a double chain conveyor, to which a number of cradles are attached. The feeder conveyor is electrically interlocked with the curing press and the delivery conveyor, and works intermittently to discharge a pair of tyres into the press on demand from the automatic press cycle.

With each movement of the feeder conveyor, a pair of empty cradles is brought in position under the overhead delivery conveyor. When the correct size tyres pass along the conveyor, air operator ramps cause the tyres to be rolled out of the carriers into the waiting cradles. Photo-electric cells are used to indicate empty and occupied cradles, and to prevent movement of the feeder conveyor unless both cradles of a pair are filled.



Automatic loading unit for rolls of rubber from strainer slabber machine on to the conveyor

Cured tyres are discharged automatically from the back of the presses onto take-away belt conveyors, and delivered to the finishing department. This technique represents a big advantage in handling tyres at this stage of manufacture. From the point of inspection and painting after building, the tyres are handled entirely automatically until arrival in the finishing section.

The larger tyres are delivered to the 75in. curing presses, the problem of handling the larger tyres in the uncured state being overcome by suspending them from specially designed grabs. These grabs are made to be readily detachable from the conveyor load trolleys, to open and close, for picking up, and releasing the tyre by electro-mechanical remote control from King 'Ski Wracker' loading and unloading units. The conveyor provides storage of one tyre per press at the unloading area, and a bank of storage at the loading stations, totalling approximately three hours stock of each size of tyre. As a tyre is used at the presses, a 'call' signal is automatically transmitted to the storage bank and a replacement released. This system eliminates unnecessary circulating of the large tyres.

Finished Goods Delivery

An overhead conveyor removes tyres from the finishing section in the building through a bridgeway to the stores. It is equipped with saddle type hooks and operates in conjunction with two auxiliary loading units for larger tyres. These comprise a pneumatically operated cradle mounted on a steel framework fixed to the floor. The tyre is rolled into the cradle and a pushbutton operated. At the approach of the next empty hook the cradle moves forward into the conveyor line and lowers sufficiently to leave the tyre suspended. Unloading at the stores is similar, but the motions reversed and the unit operated by the storeman. A number of unloading units are installed throughout the stores so that the tyres may be unloaded at the most convenient station. Smaller tyres are loaded and unloaded by hand.

Also joining this final conveyor to the stores are tyre tubes of all sizes, which are built in a separate section of the manufacturing building. The system of suspension is similar but incorporating, in some instances, trays as well as hooks.

New Plastics Company

George E. Gray Ltd. has formed a new company to handle all the group's plastic and sheet materials business.

The new subsidiary, George E. Gray (Plastics) Ltd., Eastern Avenue, Ilford, Essex, has been established 'to meet the increasing demands and the specialized needs of the furniture and building industries'.

Established for more than 75 years, the parent company is well known as an importer and distributor of laminated plastics, timber and other building materials. The group effectively covers the whole of Southern England.

The chairman of directors of the new company is E. G. Bayman, and the managing director is Geoffrey A. Bayman.

Free Aerial Offer Ends

The offer by Aerialite Ltd., Hargreaves Works, Congleton, Cheshire of 13 Video 'V' or 13 Golden Wand indoor aerials for the price of 12 will cease on April 30.

I.C.I. in Moscow

DOUBLE DECKER STAND FOR BRITISH TRADE FAIR

THE double decker stand of I.C.I. at the British Trade Fair, Moscow — designed by Mario Armengol and built by C. D. Productions Ltd. — covers 2,680 sq. ft.

Artist's impression of the stand. The top 'deck' contains 11 offices and a conference room with film-projection facilities

One of the largest stands at the fair, it has been shipped to Moscow in prefabricated form, and shows the whole range of the company's interests. Dyestuffs, plastics and fibres divisions have the three largest displays and between them occupy almost half the stand.

An illuminated Perspex mural, which is one of the stand's most striking features, covers 1,750 sq. ft. and has been engraved and coloured by a new technique. The ground floor, composed of tiles made from I.C.I. pvc has been fabricated in London for quick laying in Moscow.

Fibres division, manufacturers of Terylene polyester fibre, show the fibre's versatility in clothing and also for a number of industrial purposes. A special Terylene fashion show is being held during the Fair.

Heavy organic chemicals division, the most recently formed I.C.I. division, has already developed a substantial export trade in petroleum chemicals with the USSR. Bulk shipments of tonnage organic chemicals have been made by tankers sailing direct from the I.C.I. works on the River Tees to ports on the Baltic.

Over 50 tons of I.C.I. literature has been specially printed in Russian for the Fair.

Polythene in India

The Alkali and Chemical Corporation of India Ltd., an associated company of I.C.I., report that work on the project of manufacture of several chemicals required by the rubber industry is proceeding steadily. The project will involve an outlay of £1,500,000.

Demand for polythene in India has grown so quickly that it has become urgently necessary to extend the company's capacity. The Government has now agreed that the company may expand its present capacity of 3,500 tons a year by more than 2½ times, and this expansion is being pushed forward as a matter of highest priority.

Protecting Gas Industry

The French gas industry is reported to be using large amounts of Hypalon rubber as a protective coating against corrosion. This has followed the success of a series of tests carried out on the rubber.

At a works at Gennevilliers, an area of 4,000 sq. metres on the cyclic cracking units has been protected with coloured Hypalon coatings. Similarly, at factories at Landy and Alfortville catalytic crackers are Hypalon protected over a surface of 10,000 and 6,000 sq. metres respectively.

Test coatings were first applied in 1959 at the Cornillon works on the outskirts of Paris. Here, the rubber was applied to the exterior surfaces of storage tanks containing ammoniacal water. This liquid, containing phenolic oils, tars and other waste products, had spilled over the sides of the tanks causing stains, but the rubber coating remained intact.

As a further test, six tanks containing concentrated sulphuric acid were also coated on the outside with Hypalon. Some time later, due to the accidental fracturing of the piping, 98% concentrated acid trickled down the walls of these tanks for 24 hours. Even in these circumstances, no repairs to the rubber coating were found necessary on examination.

Recovering Nylon

The US Rubber Reclaiming Co.'s new process for recovering nylon moulding resin from scrap tyres is in the final stages of development, the company's president announced recently.

PVC COMPOUNDING AND PROCESSING

Continued from page 572

In the formulation of the powders the special features of this technique had to be taken into account. The polymer used was generally one with a K value of about 65. This had the right sort of flow characteristics but they might be varied not only by choice of K value but also by use of vinyl chloride/vinyl acetate copolymers. The amount and nature of the plasticizer also contributed to the flow of the compound.

Fluidized Bed

The actual application of the pvc to the article being coated generally took place in a fluidized bed of the compound. This consisted of a mass of powder through which a multiple jet of air was directed vertically. At some value of gas velocity the buoyancy effect on the powder was greater than the weight of the particles. At this point the powder bed looked and felt and behaved rather like a gently boiling liquid and articles could be immersed in it. Of course if the air jet was too fast the powder bed would be shot out of its container. Much expertise went into the creation of conditions which produced this 'gently boiling liquid'.

The procedure for coating an article required the preheating of the article to 200-300°C. Then immersing it in the bed for long enough to obtain the desired 'pick-up'. From thence, with the excess powder removed, it was returned to the oven to fuse the coating.

Other methods of applying sintering powders were available, including 'powder-blowing', the Engel Process and 'flame spraying', but none of them were as important in the application of pvc, as the fluidized bed technique.

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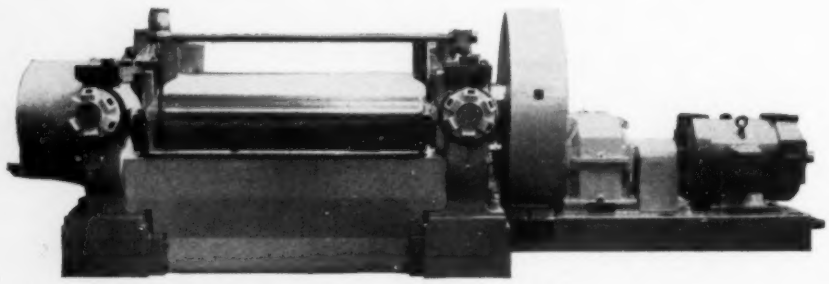

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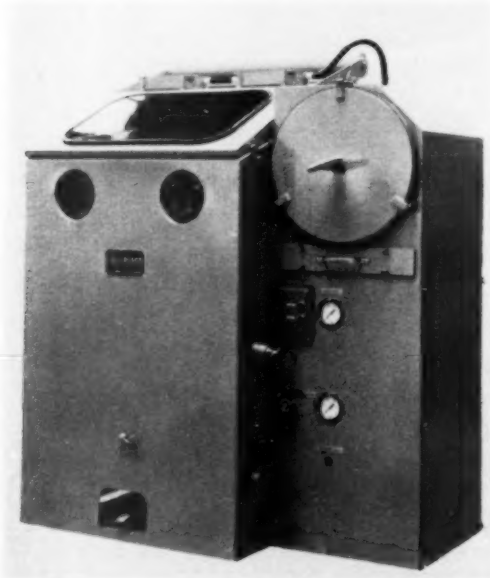
EMW & NE Exhibition

MANY MARINE APPLICATIONS OF POLYMERS

THE Engineering, Marine, Welding and Nuclear Energy Exhibition opens at Olympia on April 20 for a fortnight. Among those exhibiting will be two companies of the Dowty group — Dowty Rotol Ltd. and Dowty Seals Ltd., showing turbocharging equipment, servo valves and a wide range of seals, bondings and mouldings in natural, synthetic and silicone rubbers and in ptfe. Dowty seals are widely used in numerous engineering applications and are no doubt incorporated in much of the equipment which will be on show at the exhibition.



Vacu-Blast dry honer. One application for which this has proved successful is for removal of deposits from rubber moulds without surface damage

Palmer Aero Products Ltd. has developed a precision orbital welding method which allows a preformed tube to be automatically joined to an end fitting, and other exhibits will emphasize the non-destructive testing service offered by the company.

Control Equipment

Dallow Lambert and Co. Ltd. will display a wet deduster type MG 30 and five dust control units from the Unimaster range which is extensively used in all types of industry.

Three companies in the Darlington Chemicals group are to exhibit a wide range of products including insulating materials made from glass fibre and silica. Dust free shot blast equipment will be shown by Vacu-Blast who will also be introducing a new dry honer, claimed to eliminate all the disadvantages of slurry honing, to be easily installed and to save floor space.

Pneumatic equipment to be shown by Martonair Ltd. will include filters, valves, controllers, a tray lift and an automatic drilling and tapping machine. Similar types of pneumatic cylinders and control valves will be included in the exhibit of the Desouter group, which will also include power tools and a display by the newest member of the group, Carter Stevens (Automation) Ltd.

Push rods of many types will be shown on the stand of Guest Keen and Nettlefolds (Midlands) Ltd., which has just secured a large order for push rods from Ford-Werke Cologne — a new export field for the company.

Underwater Wear

The wide range of products to be exhibited by the Dunlop Rubber Co. and Semtex Ltd. will include collapsible containers for transporting and storing liquids or gases, de-icing equipment, anti-corrosive paints, deck coverings, flooring and belting. Underwater breathing apparatus on display will be of the damage control type, specially developed to allow the wearer to negotiate underwater hazards peculiar to salvage operations and underwater swimsuits for use under exacting conditions, and made to Admiralty specification, will also be shown. Semtex flooring and surfacings cover a wide range of uses. Many of them have appropriate Ministry of Transport and/or Admiralty approval for marine applications.

Instruments and Controls

The 1961 Midlands Exhibition of Instruments and Controls for Industry, Education and Research will take place at the YMCA, Snow Hill, Birmingham, from April 25-28.

Plastics Water Pipe

DRAFT STANDARD NEAR COMPLETION

THE General Extrusions Technical Committee of the British Plastics Federation, which originated specifications for low density polythene tubing, has for some time been working on the preparation of other specifications covering various grades of plastics pipe for cold water services and supply and for industrial uses.

As a result, British Standards for unplasticized pvc and high density polythene pipe for these purposes are now being considered by a BSI Committee and are nearing completion. These drafts include recommendations for the jointing of these pipes.

Questioned about reports of the use of thermoplastics pipes for carrying hot water, the chairman of the General Extrusions Technical Committee, C. J. Clark, said that the future possibilities of plastics in the field of hot water services were being investigated. At present, however, the Federation, which includes all the major British material manufacturers, does not recommend the use of thermoplastics for applications involving the continual passage of hot water.

Firestone Buys Tyre Division

Agreement has been reached by Dayco Corp. and the Firestone Tire and Rubber Co. of Akron, Ohio, for the purchase of the tyre division of Dayco by Firestone (*RPW*, March 11, 402). The proposed purchase price was not disclosed.

Firestone will buy the assets of the tyre division, including manufacturing facilities, equipment and furnishings, inventory and the Dayton brand names. None of the technical service agreements of Dayco or its predecessor, the Dayton Rubber Co., with foreign tyre companies are included in the sale.

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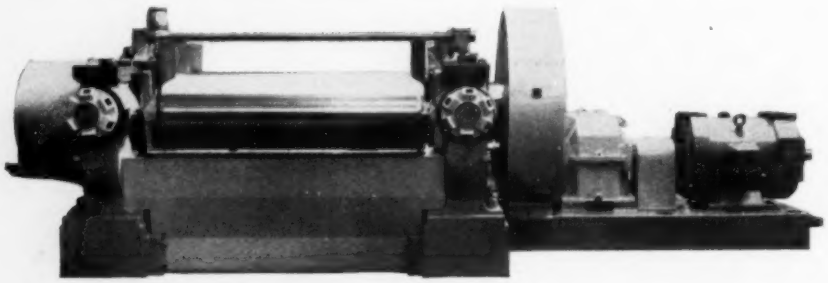

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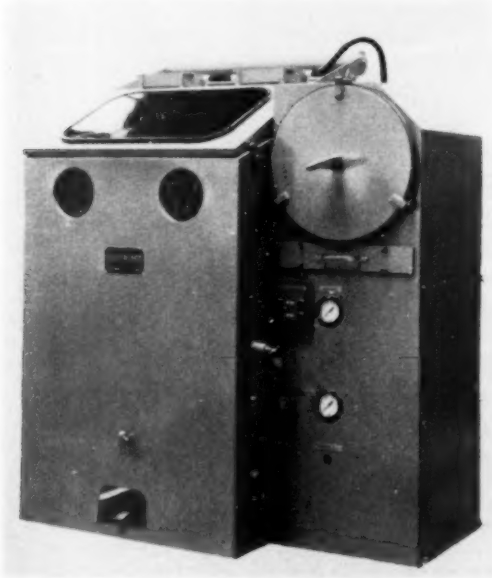

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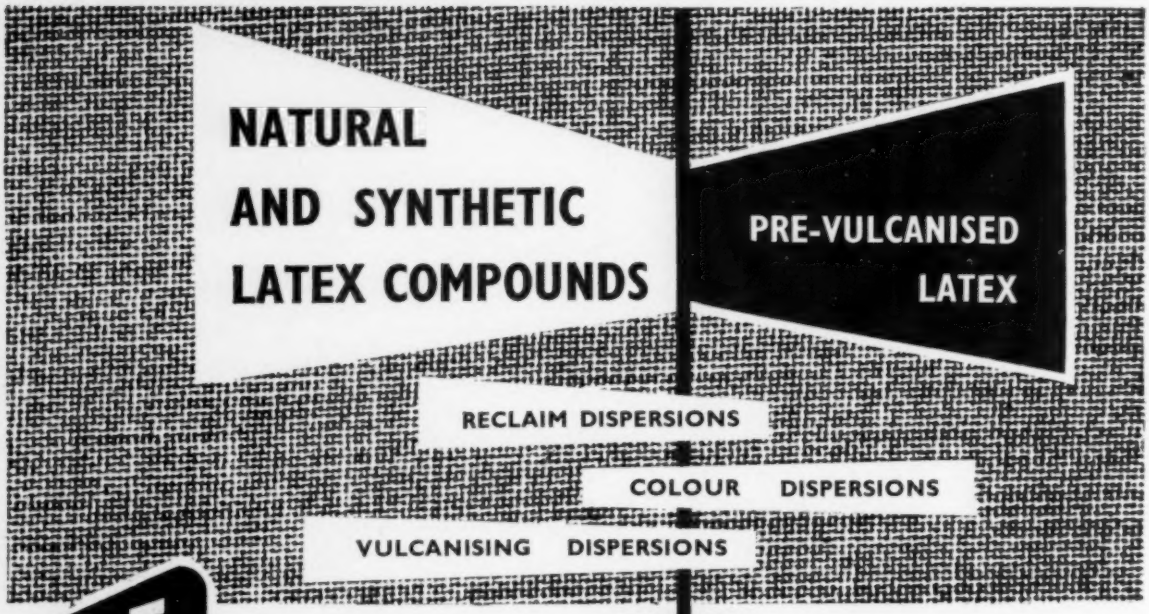

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Rubber Statistics

UNITED KINGDOM — UNITED STATES — JAPAN

UK imports of rubber (natural, synthetic and reclaimed) in February 1961 totalled 28,433 tons, compared with 22,549 tons in February 1960. Exports were 5,112 tons (5,727 in February 1960). The Board of Trade has issued the following details:

	Feb. 1961	Feb. 1960
IMPORTS		
Nigeria	1,547	1,533
Singapore	5,417	3,686
Federation of Malaya	10,246	7,987
Ceylon	823	1,237
British North Borneo	594	255
Canada	1,400	2,165
Other Commonwealth countries and Irish Republic	138	129
Vietnam	1,524	257
Indonesia	2,509	321
USA	852	3,735
Other foreign countries	3,383	1,244
Total	28,433	22,549
Rubber latex	2,537	2,644
Other raw, including crepe	22,684	12,926
Balata	10	59
Synthetic rubber	2,862	5,492
Others	340	1,428
Total	28,433	22,549
EXPORTS		
Commonwealth and Irish Republic	1,394	1,672
West Germany	427	413
Spain	744	623
Other foreign countries	1,976	2,695
Total	4,541	5,403
Synthetic and reclaimed rubber	2,863	2,435
Waste rubber	2,249	3,292
Total	5,112	5,727

United States

The United States Rubber Manufacturers' Association reports that the total consumption of new rubber in February amounted to 108,927 tons, against 121,307 tons in January.

Consumption in February comprised 31,880 tons of natural rubber and 77,047 tons of synthetic rubber (including 63,970 tons SBR).

January consumption comprised 35,149 tons of natural rubber and 86,158 tons of synthetic (including 71,653 tons of SBR).

Total synthetic rubber production in February was 102,048 tons, against 105,811 tons in January, while production of SBR was 79,662 tons, against 84,619 tons (revised) in January.

Total synthetic rubber exports in February were 27,620 tons, against 26,045 tons in January.

Japan

The Japanese Customs House has announced that Japan's crude rubber imports during February totalled 11,000 tons, compared with 11,850 tons in January.

The March import of crude rubber was estimated at 12,000 tons.

The Japanese Rubber Importers' Association reports that the consumption of crude rubber during February totalled 12,000 tons, compared with 11,500 tons in February.

The domestic consumption of crude rubber during March was estimated at 12,500 tons.

The end-February stocks of crude rubber totalled 13,140 tons. The end-March rubber stocks were estimated at 12,640 tons.

BOOK REVIEW

Polyester Resins

BRITISH Resin Products Ltd. has just published a book called Cellobond Polyester Resins.* Although this is intended as a technical manual for the guidance of users of Cellobond resins, and is distributed free to BRP customers, it deals in a quite comprehensive way with the techniques employed generally in the use of polyester resin materials.

The book is very well produced, clearly and concisely written and well provided with graphs, diagrams and tables, and the information contained in it is of such general interest that it is probable that it will eventually find a place on the shelves of many technologists as a reference work.

Largely the work of K. A. Scott and J. Macoustra, the book begins with a description of the general properties of polyesters and their chemistry, giving in some detail the factors affecting the properties of mouldings and influencing the cure speed of the resins. The Cellobond range of resins and ancillary products is described and other materials used in reinforced mouldings are dealt with, including glass fibre, fillers, pigments and parting agents.

The major portion of the volume is devoted to fabrication processes and properties of moulded materials, topics discussed including moulds and mould design, preparation of the resin mix, the wet lay-up process, match die moulding, spraying, vacuum processes, dough moulding, casting and quality control.

The remaining chapters are of a general nature and give useful information and suggestions on workshop layout and hygiene, machining and finishing of mouldings, production forecasting, costing and estimating, planning, and training and bonus schemes.

The appendices should also prove of general value to users of polyester resins and deal with test methods, raw material and equipment suppliers, literature references, conversion tables and a glossary of terms used in the manual. This last is not very comprehensive and one would have thought it unnecessary, although it is pointed out that the terms defined are likely to be unfamiliar to anyone without previous experience in the reinforced plastics industry — they should certainly be well understood by most people with more than a passing connexion with plastics.

There is a very adequate index and a great deal of trouble has obviously been taken over the production of the book which should be a useful addition to the literature on reinforced plastics.

*Cellobond Polyester Resins. Published by British Resin Products Limited. viii + 230 pp.

British Standards

BS 2050:1961

This revised British Standard is for electrical resistance of conductive and anti-static products made from flexible polymeric materials and, whereas previous editions dealt only with conductive and anti-static products made from rubber, the new edition covers plastics products as well.

Rubber and plastics can be turned into conductors of electricity by the incorporation of carbon black or other appropriate ingredients. Previous editions of BS 2050 dealt only with products deriving their conductivity from carbon black but the new one also covers those deriving their conductivity from other substances.

Limits of electrical resistance and methods of test for 24 products are specified. Among the goods dealt with are anaesthetic equipment and other articles for hospital use; floor-covering materials and footwear for explosive-handling areas; tyres for aircraft and explosive-handling vehicles; furniture buffers and feet; mattresses and pads; and conveyor belts for mining.

A foreword to the standard states: 'Experience has shown that for anti-static purposes the discharge path through a product should normally have an electrical resistance of less than 10^8 ohms at any time throughout its useful life. A value of 5×10^4 ohms for anti-static products is suggested as the lowest limit of resistance to give adequate protection against fire and dangerous electric shock in the event of any apparatus becoming defective when operating at voltages up to 250'.

The standard will be amended in the future to cover other products, as and when sufficient experience of their production and resistance limits has been gained and test methods have been agreed.

Copies of the standard may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, London, W.1, price 5s. each.

Plantation Newsletter

CONFIDENCE IN THE NATURAL PRODUCT

by our Malayan Correspondent

FROM KUALA LUMPUR

RUBBER producers here are wondering whether the revaluation of the West German mark will improve Malaya's sales of rubber to Germany.

Speculation is that if the cost of manufacturing German synthetic rubber remains the same, consumers will be tempted to turn more to natural.

Malayan rubber is bound to become cheaper in terms of the German mark. The only question now is, will there be a corresponding decrease in the manufacturing cost of synthetic in West Germany?

Commented one economist: 'If it was a straight matter of a Malayan product competing with an identical German product, the revaluation of the mark would give our product the advantage'.

British and American car manufacturers, for instance, are looking forward to better sales in the German market.

But Malaya is not exporting anything to Germany that competes with her own products, apart from rubber. And the producers of natural in this country do not know enough about the effect of the mark revaluation on Germany's synthetic manufacture to venture any firm predictions.

On the other side of the picture, German exports to Malaya are expected to show a slight price increase. The old exchange rate was 137 marks to $100 (Malayan). The new rate is 130 marks to $100.

Family Planning

The mounting birth rate among estate workers in Malaya is costing managements so much in social services that it has become a 'matter of concern'.

This concern was reflected in the latest report of the Johore Planters' Association which noted that the labour lines were becoming crowded with 'constantly increasing' numbers of children.

The report said that the direct cost to estates of corresponding social services in the way of schools, medical services, housing and maternity allowances to women in a constantly renewed condition of pregnancy, was a matter of concern.

It would certainly be more so if the price of rubber declined, it warned. 'There is no little merit in the suggestion that a woman should be granted a maternity allowance for a maximum of three pregnancies as the present system merely encourages child-bearing', the report said.

It stated that family planning was a matter which more and more estates would like to see taken seriously.

Improvements Through Research

The retiring managing director of Dunlop Malayan Estates Ltd., Mr A. W. Goode, said the main testing time for natural rubber was still in the future.

He said that a strong and competitive natural rubber industry was necessary to combat any inroads into the rubber market by synthetic materials.

Mr Goode, who has served the rubber industry for 33 years, agreed that research was playing an increasingly important part in improving the quality of the rubber tree and the end product.

He was full of praise for the initiative and foresight shown by the Malayan Government in its economy planning.

Mr Goode said the Government, employers and workers had all co-operated in laying firm foundations for the future of the rubber industry in this country.

He will be succeeded as managing director by Mr M. E. L. Robey.

KL Rubber Exchange

The chairman of the Singapore Chamber of Commerce Rubber Association, Mr E. G. Holiday, has assured members of his association that the formation of a rubber exchange in Kuala Lumpur would not adversely affect the Singapore market.

He said that committee members of the association had attended several meetings with Federation Government and trade organizations officials to discuss the formation of the exchange.

'There are, of course, quite healthy markets both in Kuala Lumpur and Penang, and an exchange on the lines proposed should be a good thing and will in no way adversely affect the Singapore market. In fact, the reverse is more likely', he said.

On the rubber market, Mr Holiday reported that the average price last year was 120½ cents (Malayan), 'truly a remarkable level in view of the availability of the synthetic product'.

The sales of natural rubber from Britain and American stockpiles, however, was an adjusting factor steadily undermining the unduly high price structure, he added.

Aerosol Silicone

A liquid, room temperature vulcanizing, silicone rubber in aerosol spray cans is now being marketed in the UK by International General Electric.

The new product may be used for encapsulating, as a release agent for moulded plastics, or for other applications where a thin, heat resistant, protective, shock-absorbent or non-conductive coating is required.

The spray is applied directly. Cure time ranges from 15 minutes to several hours after spraying with a separate curing agent. Where bonding is required a primer is used.

First Meeting

At the first board meeting of CIBA UK Ltd., held recently, J. M. Baldock agreed to join the board of directors. Mr Baldock was Conservative Member of Parliament for the Harborough division of Leicestershire until 1959.

Other members of the company's board are: Dr R. Käppeli, chairman; Sir Arthur Vere Harvey, managing director; Dr A. Wilhelm, Dr A. Brunner and Sir Joseph Napier.

First winner of the Owens-Corning Reinforced Plastics Design Award is a 26ft. whale boat. M. T. Nemeyer (*left*) **is here shown presenting the award to James S. Lunn** (*centre*)**, President, Lunn Laminates Inc., makers of the boat, watched by William T. Cruse of the American Society of the Plastics Institute**

Rubber and Plastics Stock Market

A REVIEW OF PRICES AND TRENDS

IT has been a fabulous springtime for share prices in the stock market these past few weeks. Both before and after the Easter break, investors never let up once and their mad buy-buy mood spread a boom-like touch just about everywhere. In the four days immediately following the holidays the *Financial Times* industrial index shot up nine points to reach a new all-time peak of 351.4. This in spite of the news concerning the hefty fall in our gold and dollar reserves and the Economic Survey which suggested that perhaps it will after all be a steady-as-you-go Budget on April 17. What is more there were definite signs that the volume of actual trading passing through brokers' hands was much larger too. Most of the spade work was again done by the small buyers who, as a body, seemed to have reached a silent agreement to keep prices buoyant. So far the big institutions have failed to play a dominant role. How long can they afford to sit on the millions that they must have accumulated? The way things are going at the moment I for one would expect some kind of action from this particular section of the investment world soon. Managers of huge funds do not like to see lush profits slip through their hands. At present there is no evidence at all that the present boom will not continue. Dealers are still very short of stock and try as they do they have been unable as yet to get the market down. The bears just recently have had a thorough thrashing from the bulls and have paid heavily for the pessimism they spread at the start of the year. Fortunately in our efforts at crystal gazing for 1961 we took a more rosy view about the chances of further improvements especially for the leaders. And this is how three of our old-established favourites have fared since the turn of the year.

ENGLISH CHINA CLAYS + 24s. 6d.
IMPERIAL CHEMICAL ... + 11s. 3d.
TURNER AND NEWALL + 19s. 6d.

Good to see that my own particular tip, Turner and Newall, which I recommended to readers only a short time ago when they stood below 60s., has done so well.

Meantime, as will have been noticed by our coverage last week, company news continues to flood in from all directions. Among the reports from the boardrooms that came one belonged to the PROJECTILE AND ENGINEERING Co. It told shareholders that

Continued on page 592

Share Price Movements

Par Value	Company	1960-61 High	Low	Apr. 1	Latest
£1	A.E. Ind. Ord.	67/-	39/-	44/9	44/3
5/-	Albright & W. Ord. ..	34/3	25/-	27/9	27/3
£1	" " " 5% Pref.	17/3	14/3	14/3	14/6
5/-	Anchor Chemical Ord. ..	23/6	14/9	20/-	20/-
4/-	Airfix	50/-	23/-	49/9	49/6
4/-	" Non Voting ..	46/3	23/-	46/3	45/6
5/-	Andersons Rub. Ord. ..	—	—	3/9	3/9
£1	Angus Geo. Ord. ..	74/-	34/9	72/-	73/-
5/-	Ault & Wiborg Ord. ..	28/6	20/-	28/3	28/6
£1	Avon India Rubber Ord.	46/6	30/-	38/6	37/6
£1	" " " 6% Pref.	20/-	17/6	18/9	18/9
10/-	Bakelite Ord.	56/3	33/3	51/-	55/9
£1	" 6% Pref. ..	19/3	16/9	18/-	18/-
£1	Baker Perkins Ord. ..	55/-	39/1½	52/-	55/-
4/-	Bank Bdg. Rubber Ord.	4/3	1/9	3/3	3/6
4/-	Bettix	—	—	11/6	11/3
4/-	Brammer H. Ord. ..	18/6	16/3	16/9	16/6
10/-	Bridge, David Ord. ..	66/6	48/-	60/6	56/3
5/-	Bright, John Ord. ..	18/6	14/3	15/6	16/6
5/-	Brit. Blting & Asb. Ord.	20/3	17/-	19/9	20/3
£1	" " " " Pref.	—	—	15/9	15/9
5/-	British Electronic Indus.	15/-	12/-	14/1½	14/4½
2/-	Brit. Ind. Plas. Ord. ..	14/3	5/3	14/-	13/9
2/-	" 10% (tax free) Pref.	4/9	4/3	4/9	4/9
£1	British Xylonite Ord. ..	93/-	50/6	90/-	90/-
£1	" " 5% Pref.	18/9	14/-	14/4½	14/4½
£1	BICC Ord.	61/3	47/6	57/3	58/6
5/-	BTR Ind. Ord.	18/9	9/9	18/3	18/6
£1	" " 7½% Pref. ..	24/3	21/3	21/3	21/3
£1	Courtaulds Ord.	59/4½	42/-	40/7½	43/9
£1	" 5% 1st Pref.	17/9	14/9	14/9	15/-
£1	" 6% 2nd Pref.	21/-	17/9	17/6	17/9
4/-	Cow, P. B. Ord.	9/9	6/9	8/7½	9/7½
£1	" " 5% Pref. ..	15/6	13/6	13/6	13/6
1/-	Dannimac Mfg. Ord. ..	15/-	9/-	14/3	14/6
10/-	De La Rue Ord. ..	78/6	47/9	60/9	60/9
£1	" " " 3½% Pref. ..	12/-	10/-	10/-	10/-
10/-	Distillers Co. Ord. ..	38/3	27/9	36/-	37/-
£1	" " 6% Pref. ..	22/-	19/-	19/6	19/-
£100	" 5% Conv. Loan	£96	£93	£95	£95
£100	" 5½% Unsec. Loan	£97	£80	£81	£80½
10/-	Dunlop Rubber Ord. ..	30/6	19/9	23/9	25/-
£1	" " 5½% Pref.	19/-	15/3	15/3	15/6
£100	" 3½% 1st Debs.	£78	£68	£68	£68
£100	" 4½% 2nd Debs.	£87	£77½	£79	£78
£1	Eng. Elect. Ord. ..	53/6	30/9	37/9	37/-
4/-	Ebonite Cont. Ord. ..	14/3	7/9	7/9	8/3
£1	English China Clays Ord.	106/3	69/-	100/9	106/3
£1	Goodyear Tyre 4% Pref.	12/9	10/6	11/3	11/3
5/-	Greeff Chem. Ord. ..	35/-	23/-	29/6	30/6

Par Value	Company	1960-61 High	Low	Apr. 1	Latest
10/-	Greeff Chem. 5½% Pref.	9/-	7/1½	7/9	7/6
4/-	Greengate & Irwell Ord.	6/6	5/3	5/9	5/9
5/-	Hackbridge Hldg. ..	8/7½	5/-	6/3	6/3
£1	Harrisons & Crosfield Dd.	64/-	48/6	55/-	55/-
1/-	Hunt & Moscrop Ord. ..	2/9	1/4½	2/1½	2/-
£1	Imp. Chem. Ord. ..	75/3	54/3	70/9	73/9
£1	" " 5% Pref. ..	18/-	14/6	15/3	15/-
£100	" 4½% Unsec. Loan	£89½	£78	£80	£79½
£100	" 5½% Conv. Loan	£212½	£90xc	£90	£90
1/-	Kleemann (O. & M.) Ord.	18/9	8/3	18/3	18/3
£1	" 6½% Pref.	19/-	16/3	16/3	16/3
5/-	Laporte Ind. Ord. ..	33/6	21/3	29/3	28/9
£1	" " 7½% Pref.	24/3	21/3	22/-	21/9
£1	Leyland & Birm. Rubber Ord.	63/-	46/3	53/9	58/-
£1	" " " 6% Pref.	19/-	17/6	18/1½	18/1½
2/-	London Rubber	21/-	11/-	19/9	20/9
£1	" 6% Red. Cum. Pref.	20/-	18/-	17/6	17/6
£1	McKechnie Bros. Ord. ..	71/6	53/6	55/-	55/-
£1	" " 'A' Ord.	69/3	52/6	54/6	55/-
£1	" " 6% Cum. Pref.	18/-	16/-	17/-	17/-
5/-	Monsanto Chem. Ord. ..	31/-	23/-	24/9	24/9
£1	" " 3½% Pref.	12/9	11/9	12/-	12/-
£100	" " 6% Debs.	£103½	£96	£97	£97
5/-	Miles (H.G.) Hldgs. Ord.	11/3	7/-	7/6	7/-
2/-	Movitex	—	—	6/6	6/7½
£1	North British Rubber ..	21/3	13/9	14/-	13/9
5/-	Northwestern Rubber ..	13/-	9/-	12/-	12/-
5/-	Plastic Enginrs. Ord. ..	37/6	20/-	37/6	37/6
10/-	Projectile & Eng. Ord. ..	40/-	18/6	37/9	34/-
5/-	Redfern Holdings Ord. ..	5/9	3/1½	4/-	3/3
2/-	RFD Ltd. Ord.	6/6	3/4½	4/6	4/3
£1	" " 5½% Pref. ..	14/6	11/9	13/3	12/9
2/-	Rubber Imp. Ord. ..	7/9	3/1½	4/9	4/-
2/-	" " 'A' Ord. ..	7/-	3/-	3/9	3/-
£1	" " 5% 1st Pref.	15/-	11/3	12/3	12/3
5/-	Rubber Reg. Ord. ..	19/3	16/9	17/6	17/3
4/-	Shaw Francis Ord. ..	27/6	17/3	23/-	23/-
2/-	Silentbloc Ord.	13/3	8/6	9/6	9/3
5/-	Storey Bros.	46/-	28/3	44/3	42/3
2/-	Sussex Rubber Ord. ..	2/3	1/3	1/9	1/10½
5/-	Sutcliffe Speak Ord. ..	17/6	11/-	17/-	16/3
£1	Tootals	34/3	26/4½	30/3	33/9
£1	Turner & Newall Ord. ..	73/9	48/3	70/-	73/9
£1	" " " 7% Pref.	25/-	21/3	21/3	21/3
5/-	Universal Asbestos Ord.	22/6	17/9	26/3	22/3xc
5/-	Viscose Dev. Ord. ..	16/6	14/9	15/6	15/6
5/-	Warne W. (Holdgs.) Ord.	21/3	14/9	18/6	21/-

Rubber Markets

LONDON

An only slightly interrupted advance put prices up by one penny per lb. The higher level was a reflection of a recovery at Singapore and was attributed largely to increased Malayan exports during March. It was not accompanied by much activity. Operators were hesitant and values tended to sag in the absence of buying support.

Latest prices are as follows:

No. 1 RSS Spot: 26¼d.-26⅜d.

Settlement House:

May 26¼d.-26⅜d.
June 26¼d.-26⅜d.
July/September 26¼d.-26⅜d.
October/December 26¼d.-26⅜d.
January/March (1962) 26¼d.-26⅜d.
April/June 26¼d.-26⅜d.

No. 1 RSS cif basis ports:

April 26d.-26¼d.
May 26d.-26¼d.
June 25⅞d.-26⅛d.

Godown:

April 88¾ Straits cents nominal.

Latex

Centrifuged 60% latex per gallon in drums, seller, April, May, 15s., cif European ports. Spot, seller, 15s. 6d. Bulk, seller, d.w. 14s. 11d. Creamed, seller, 14s. 9d. nominal. Normal, seller, April, May, 12s. 1d.

NEW YORK

The New York rubber market ruled a under on April 10:

Dealers' Prices

	US cents per lb., ex-dock	
	April 10	Previous
No. 1 RSS, April ..	30⅛n	30¼n
May ..	30b –30¼a	30n
No. 2 RSS, April ..	30⅛n	30n
May ..	29⅞b–30¼a	29⅞n
No. 3 RSS, April ..	30⅛n	29⅞n
May ..	29⅞b–30a	29⅞n
No. 1 RSS, Spot ..	30⅛n	30⅛n
No. 3 amber blanket crepe, April ..	24⅞n	24⅞n

Futures—Rex Contract

	April 10	Prev. Close
May ..	30.70b–30.80a	30.05b–30.30a
July ..	30.65t	29.95b–30.00a
Sept. ..	30.45t	29.80b–29.90a
Nov. ..	30.40–30.35t	29.70b–29.85a
Jan. ..	30.20b–30.30a	29.70b–29.75a

Sales: 67. Tendency: Firm.

Futures were firm on April 10 and up about half a cent per lb. on commission house buying in light dealings. Physical rubber was quiet. In later dealings, futures held firm on continued commission house buying in fair dealings.

SINGAPORE

Idle conditions prevailed throughout the morning of April 10. Fluctuations were small and interest in most grades negligible. Quotations were nominal. In the afternoon, the market continued very quiet. Prices were barely changed and exchanges limited. Lower sheets were in some demand.

	Malayan cents per lb., fob Malayan ports to open ports	
	April 10	Prev. Close
No. 1 RSS, April ..	85⅞–86	85¼–85¾
May ..	86¼–86½	85⅞–86
No. 2 RSS, April ..	84⅞–85⅛	84⅝–85¼
No. 3 RSS, April ..	84½–84⅝	84 –84½
No. 4 RSS, April ..	81⅜–82⅜	81½–82½
No. 5 RSS, April ..	74½–75¼	74 –74⅞
No. 1 RSS, Spot ..	85⅜–86	85 –85½
No. 3 blanket thick re-milled crepe, April	67 –68	67 –67⅞
No. 1 fine pale crepe, April	90¾–91⅞	90½–91¼
2X thin brown crepe, April	65¼–66¼	65 –66

Tendency: Quiet.

The Industries Syndicate quote latex, native produce, 60% centrifugal, packed in rectangular drums, fob at 168.00d. per gallon.

AMSTERDAM

The Amsterdam rubber market ruled as under on April 10:

No. 1 RMA	Guilders per kilo	
	April 10	Previous
April	2.38	2.37
May	2.38	2.37
June	2.38	2.37
April June ..	2.38	2.37
July	2.38	2.37
August	2.38	2.37

Sales: Nil. Tendency: Very quiet.

DJAKARTA

Buyers were scarce and offerings were small on April 10. Sales included between 20 and 30 tons of sheet No. 1 at 36 rupiahs per kilo. The market closed steadier.

	Rupiahs per kilo	
	April 10	Previous
Spot No. 1 Priok ..	35.00b	35.25b
Spot No. 2 Priok ..	34.00b	34.25b
Spot No. 3 Priok ..	32.25b	32.50b
No. 1 fine pale crepe, spot	31.00b	31.50b

BANGKOK

The price of No. 1 RSS at Bangkok on April 10 was 27.37½ (27.37½) US cents per lb.

CEYLON

The price of No. 1 RSS at Colombo on April 10 was 104¼ (103½) Ceylon cents per lb.

STOCK MARKET

Continued from page 591

their dividend was going to be stepped-up from 15% to 18%. After the tax charge net profits came out at £149,400 against £138,000. But the directors said that it would be difficult to repeat in 1961 the favourable results of last year. But they hoped nevertheless to maintain the dividend. With regard to the current year they said that the recession in the car industry continued to affect output in the early months. However, it was anticipated that turnover should continue at a reasonably satisfactory level.

British Insulated Callender's Cables has formed a new company called Telcon Plastics. From the beginning of the month this firm centred at Green Street, Orpington, Kent, took over the entire range of activities of the plastics division of Telegraph Construction and Maintenance, an offshoot of BICC. Telcon Plastics will continue to make and develop all the plastic products with which the name Telcon is already associated.

Companies in the News

Baker Perkins

Ordinary stockholders of Baker Perkins are to receive a final dividend of 8¾%, making a total of 11¼% for 1960. This compares with the equivalent of 8% for 1959, after adjustment for a one-for-four scrip issue.

Group profit, before tax, rose from £771,526 to £1,193,201. Net profit attributable to Baker Perkins was £530,042, an increase of 27%, after tax of £563,388. The board have recently foreshadowed that the dividend for 1961 should be maintained at the 11¼% rate on the capital as increased by the February rights issue. A recommendation has been made by the directors that the ordinary capital should be increased by £2m.

Perstorp Distributors

G. and R. (Boards and Plastics) Ltd. has been appointed official distributors in Scotland for Swedish Perstorp laminated plastics.

Letters and digits for car number plates are being manufactured by John Ireland (Wolverhampton) Ltd., using Rigidex high density polythene

Industry INTELLIGENCE

Technical Data

Carlona Polythene

Shell Chemical Co. has issued several technical bulletins on new grades of Carlona Polythene. These include 18-005 BB which is designed to meet the more critical applicational requirements of the bottle-blowing industry, 18-020MA which is primarily intended for injection moulding applications, and 20-020FE which is suitable for the production of high clarity tubular film of good gloss and transparency. In each pamphlet the applications are given, and a table gives physical properties of the material.

Polysar Nitrile Latex

Two technical reports issued recently by Polymer Corporation Ltd., and available in this country from Polymer (UK) Ltd., Walbrook House, Walbrook, London, E.C.4, give compounding details and properties of two latices.

Polysar latex XPRD 845 is a high solids nitrile latex which can be readily handled in conventional processing equipment to produce oil resistant foam rubbers with a wide range of densities. Total solids content is 63.5% and the material is expected to prove useful for applications such as impregnated textiles and paper, where resistance to oil and dry cleaning solvents is desired.

Polysar latex XPRD A-249 is a cold polymerized, non-staining and non-discolouring butadiene/acrylonitrile copolymer having an acrylonitrile content of about 48% by weight. In processability and physical properties stocks based on XPRD A-249 are similar to Krynac 801 but the former has superior resistance to swelling in aromatic fluids.

Pliabrac Plasticizers

A revised edition of a technical service bulletin on Pliabrac low-temperature plasticizers has recently been published by A. Boake, Roberts and Co. Ltd., Abrac Works, Stratford, London, E.15, reference No. 234c.

Pliabrac 980, 989 and 990 are secondary plasticizers for pvc and are normally used in quantities up to 30% of the total plasticizer content. In cases where good resilience and low temperature properties are required, quantities greater than this may be employed.

Main advantages claimed for these products include their ability to impart good low temperature properties and resilience, they are very economically priced, have good light and heat stability and give products with low volume resistivity, thus making them very suitable for use in the formulation of antistatic compounds.

They are also of low viscosity and solvating power at normal temperatures and have comparatively low volatility. They are therefore useful for the formulation of plastisols, and can be used in thin sheeting where they impart improved handle and drape.

Machines, Materials and Equipment

Portable Drum Heater

Viscous or solidified products such as waxes, resins, asphalts and bitumen are often supplied in metal drums from which they can only be discharged when hot.

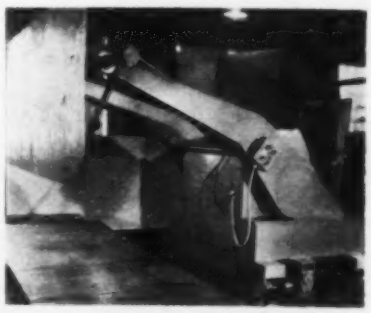
A convenient electric drum heater has recently been produced by Electrothermal Engineering Ltd., 270 Neville Road, London, E.7, for use in such cases.

The heater is in the form of a band encircling the drum, and held in close contact with it by a strong spring, to assist thermal transfer.

Economy is possible by using only a single heater near the top of the drum when a portion of the contents is to be removed, and additional heaters are used if it is required to melt the whole contents.

Giant Laminating Presses

Pathex (Canada) Ltd. has developed an automated loading and unloading system for large multiple-platen laminating presses. Six installations are now in operation in Canada and USA and the companies that have installed Pathex machines have reported increases in production efficiency and cost savings.



The main problem of large multi-platen laminating presses of this type has been the excessive idle time required for feeding of materials and removal of finished products. The average press cycle time required by plastic laminates is 80 minutes, and preparation of materials and caul-plates, feeding and removal of completed product can be as much as 30 minutes. Now, Pathex claims that its system cuts the idle time down to 30 seconds.

Full details are available from Pathex (Canada) Ltd., 107 Tycos Drive, Toronto, Canada.

GRP Teeth

While the use of plastics in dental plates is by no means new, a recent development is the use of glass reinforced resin material as a filling for teeth. This is claimed to be superior to either the silicate or acrylic types used previously, and can be used by the dentist without radical changes in technique. Made by the American Consolidated Manufacturing Co. Inc., 835 N. Nineteenth Street, Philadelphia 30, Pa., and marketed under the name Mer-Don 7, the new filling has been shown to outlast more conventional materials both in colour and contour. Improved properties claimed for it include greater impact strength, wear resistance and fluid resistance, no shrinkage on setting and good adhesion to cavity walls.

Publications

Cariflex SBR

Shell Chemical Co. Ltd. has issued a booklet called 'Success with Cariflex SBR'. This product has inherent properties, both material and economic, which makes its use attractive in many ways. Therefore a simple summary to the introduction of Cariflex SBR in the factory was thought to be needed. Hence, this new booklet which gives reference to a number of techniques by which Cariflex SBR can be utilized to best advantage.

The publication includes news on the compounding and processing of Cariflex SBR, and gives tables showing the properties of Cariflex vulcanizates. Photographs, diagrams and charts complete the booklet, further information of which can be obtained from Shell Chemical Co. Ltd., Public Relations Department, 170 Piccadilly, W.1.

Elastomers Notebook

Du Pont has recently published its 18th Elastomers Notebook which contains articles on neoprene, Hypalon and Viton. Because of its oil and abrasion resistance, neoprene was selected for the tank linings used in a South African uranium reduction plant. Viton was used in a nozzle design to increase the effective height of a smokestack by 100ft., and a Hypalon linesmen's blanket withstood 147 hours' testing at 15,000 volts and still retained its full insulation value.

These and several other examples of the uses of Du Pont products are given in full in the notebook, which is well illustrated with photographs and diagrams.

Future Events

Institution of the Rubber Industry

Humberside Section.—April 20 at the Yarborough Hotel, New Holland, at 8 p.m. Annual general meeting and short papers.

Plastics Institute

Midlands Section.—April 21 at the James Watt Memorial Institute, Great Charles Street, Birmingham 3, at 6.30 p.m. 'Productivity in the Plastics Industry', by N. Giles, MA (Urwick, Orr and Partners Ltd.). April 19 at the Victoria Hotel, Wolverhampton, at 7.30 p.m. 'Health Hazards and Labour Selection'.

North-Eastern Section.—April 19 at the Eldon Grill, Grey Street, Newcastle upon Tyne, at 7 p.m. Annual general meeting.

Southern Section.—April 22. Visit to the Severn Wild Fowl Trust, Slimbridge.

Export Opportunities

Plastics Containers for Canada

Emmans Ltd., 1410 Stanley Street, Montreal, P.Q., wish to get in touch with UK suppliers of chemical stoneware or reinforced plastics products which substitute for the stoneware. The Canadian firm has for some time supplied chemical stoneware to many firms, but as its present supplier is to discontinue manufacturing chemical stoneware shortly, is seeking an alternative connexion.

Manufacturers interested should write first to S. W. Pincott, vice-president, Emmans Ltd., at the above address, sending a copy of their letter to the UK Trade Commissioner, 635 Dorchester Boulevard West, Montreal, P.Q.

Calls for Tenders

Plastics Ware

Plastics ware comprising plastic basins, buckets, soap dishes and cruets, is required by The Controller, Government Central Stores, P.O. Box 8096, Causeway, Southern Rhodesia. Free samples of the articles needed should be sent to this address. Otherwise, all bids should be sent to the Secretary, Federal Tender Board, P.O. Box 8075, Causeway, Salisbury, Southern Rhodesia, quoting Tender Notice No. GCS 233. Closing date: April 28 1961. (Ref. ESB/11846/61.)

Changes of Name

Precision Components (Barnet) Ltd. (485,182). 13 Byng Road, Barnet, Herts. Name changed to Kabi (Electrical and Plastics) Ltd. on August 11 1960.

Cooper and Co. (Foams) Ltd. (618,010). Winchester House, Victoria Square, Birmingham, 2. Name changed to Coopers Plastic Foams Ltd. on August 10 1960.

Whitecroft Engineering Co. Ltd. (393,427). Whitecroft, Glos. To market, deal in rubber, horn, balata, etc. Name changed to Allen and Whitecroft (Sales) Ltd. on July 27 1960.

Godfrey Holmes (Plastics) Ltd. (433,470). Lincoln Road, Wragby, Lincoln. Name changed to Wragby Plastics Ltd. on August 8 1960.

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

Haga (B807,666). Woven rugs (not for personal use) made of polyvinyl chloride plastics. Hagaplast Aktiebolag (a joint stock company organised under the laws of Sweden), Brogatan 28, Anderstorp, Sweden. Address for service is c/o Margit Bergström, 13 Cornwall Gardens, London, S.W.7. (Class 27; February 15 1961.)

Isomode (B810,348). Sheets, pads and blocks, all made of rubber or of synthetic rubber; and sheets, pads and blocks, all made of synthetic resin plastics and included in Class 17. Textron Electronics Inc., 10 Dorrance Street, Providence, State of Rhode Island, United States of America. Address for service is c/o J. Y. and G. W. Johnson, 47 Lincoln's Inn Fields, London, W.C.2. (Class 17; February 15 1961.)

Coroflex (810,461). Adhesive tapes, bands and strips, all included in Class 26, wholly or principally of plastics. Fritz Müller 'Coroplast' K.G., 271 Wittener Strasse, Wuppertal-Nächstebreck, Germany. Address for service is c/o H. A. L. Venner, 1 Great James Street, Bedford Row, London, W.C.1. (Class 26; February 15 1961.)

Gunolith (814,223). Refractory materials in plastic or in powder form for use in lining furnaces, foundry ladles and moulds. Chambers Brothers Ltd., Effingham Mills, Stoke Street, Sheffield, 9. (Class 19; March 1 1961.)

Syntosil (811,874). Papers, pasteboards and cardboards, all being sensitized and for use in industry, science and photography; cellulose and preparations consisting wholly or principally of cellulose; and raw and partly prepared materials included in Class 1 for use in making papers, pasteboards and cardboards. Zürcher Papierfabrik An Der Sihl (a joint stock company organized under the laws of Switzerland), Giesshübelstrasse 15, Zürich, 3, Switzerland. Address for service is c/o Hans and Danielsson, 51 King Square, London, E.C.1. (Class 1; March 1 1961.)

Polybricks (810,710). Building blocks made of plastics. Rupert Brooke, 22a Kings Road, St. Leonards-on-Sea, Sussex. To be associated with No. 810,709 (4305, 300). (Class 19; March 1 1961.)

Ferrolube (802,615). Plastics in the form of sheets, blocks, rods and tubes, all for use in manufactures. Pure Chemicals Ltd., 9 Basinghall Street, London, E.C.2. To be associated with No. 802,614 (4305, 288) and others. (Class 17; March 1 1961.)

NEW COMPANIES

Color Dispensers Ltd. (685,208). March 3. Capital: £100 in £1 shares. To carry on the business of manufacturers, buyers and sellers of, and dealers in, plastic products, etc. The first directors are: Stanley J. Clayton, 30 Blacklow Brow, Huyton, near Liverpool; Joseph Norton, 15 Green Lane, Allerton, Liverpool. Regd. office: 711 Tower Building, 22 Water Street, Liverpool, 2.

Eternite Co. Ltd. (684,173). February 22. Capital: £20,000 in £1 shares. To carry on the business of manufacturers of, and dealers in, carbon, case hardening compounds, open hearth compounds, liquid case hardening compounds, anti-carburizing paints, oils, solvents, plastics, and general and heavy chemicals; designers and manufacturers of, and dealers in, all kinds of plant and equipment for use in connexion with such products, etc. The directors are: John B. Aldred, Hecadeck House, Burgage Lane, Southwell, Notts; Archibald H. Churchouse, 51 Carlton Avenue, Worksop. Regd. office: Oakwood Chemical Works, Sandy Lane, Worksop.

G.T.R. Tyre Services (Liverpool) Ltd. (683,197).—February 13. Capital: £1,000 in £1 shares. The directors are: Claude S. Birks, Rocky Mount House, Mill Lane, Aughton Green; Ronald H. Birks, 4 Park View, Thornton. Regd. office: Wakefield Road, Netherton, Liverpool, 10.

H. and P. Tyre Co. (Maidstone) Ltd. (683,198).—February 13. Capital: £100 in £1 shares. The directors are: Edward B. Rolfe and Dorothy H. Rolfe, both of 33 Ashford Road, Bearsted, Maidstone. Regd. office: 17 Hart Street, Maidstone, Kent.

H. Berman (Sales) Ltd. (683,364).—February 14. Capital: £100 in £1 shares. To carry on the business of wholesale and retail dealers in and distributors, manufacturers, exporters and importers of toys, novelties, fancy goods, rubber goods, cosmetics, beauty preparations, etc. The directors are: Harold Berman and Freda Berman, both of 94 Drewstead Road, S.W.16 (directors of H. Berman (London) Ltd.); Desmond O'Neill, Abraham Zetter and Thomas R. Docwra. Regd. office: 69/73 Lausanne Road, S.E.15.

Lirchada Ltd. (685,990). March 10. Capital: £100 in £1 shares. To carry on the business of manufacturers of, and dealers in, fancy goods of all kinds, plastic rubber, leather and other goods, etc. The first directors are to be appointed by the subscribers. Regd. office: 713 Imperial House, Kingsway, W.C.2.

Walton Surgical Appliance Co. Ltd. (684,377). February 24. Capital: £5,000 in £1 shares. To acquire the business of a manufacturer of, and dealer in, surgical and rubber appliances now carried on by George E. Key at 85 Queen Street, Portsmouth, and elsewhere as 'Walton and Co.'. The first directors are: George E. Key and Mrs. Milly Key, both of 'Southdowns', 134 Portchester Road, Fareham, Hants;

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Martin E. Key, 17 Edward Grove, Portchester, Hants; Robert W. Page and Mildred N. Page, both of 1 Malvern Road, Southsea. Regd. office: 85 Queen Street, Portsmouth.

Thermo-Plastic Co. Ltd. (683,823). February 20. Capital: £5,000 in £1 shares. To carry on the business of manufacturers, designers, fabricators, converters and processors of, and dealers in, reinforced plastic and general engineering products, workers in plastics, etc. Norman H. Humphreys is the first director. Regd. office: 2 Brunswick Square, Bristol, 2.

Val-Flax Ltd. (684,374). February 24. Capital: £100 in £1 shares. To carry on the business of packers, carriers, forwarding agents, warehousemen and manufacturers of, and dealers in, packaging materials and technical and domestic plastics, etc. The first directors are: Anthony C. Anselm, Sylvan, Oatlands Chase, Weybridge, Surrey; Frederick B. Young, 28 Lynwood Close, Woking. Regd. office: Sheerwater, Woking, Surrey.

Architectural Plastics Ltd. (685,364). March 6. Capital: £100 in £1 shares. To carry on the business of distributors of, and dealers in, sheet plastics, etc. The directors are: Blanche Manders, Traveller's Rest Cottage, Clifton, Otley; Dora F. C. Horne, 12a Kings Road, Bramhope, near Leeds. Regd. office: 69 Albion Street, Leeds.

Allwright Plastics Ltd. (685,445). March 6. Capital: £100 in £1 shares. The directors are: Albert E. Allwright, 26 Hurst Crescent, Portslade, Sussex; Edwin Tyldesley, 34 Denton Drive, Patcham, Brighton; Frederick Evershed, Evershed Court, Fairlight Avenue, Telscombe Cliffs, Sussex. Regd. office: Evershed Court, Fairlight Avenue, Telscombe Cliffs, Sussex.

Associated Resin Compounds Ltd. (685,587). March 7. Capital: £1,500 in £1 shares. The directors are: Norman S. Bransgrove, 24 Harvard Court, Honeybourne Road, N.W.6; Daniel Moore, 32 Eden Court Road, S.W.16; Anthony A. Phillips, 23 Harvard Court, Honeybourne Road, N.W.6. Regd. office: 4 Paper Buildings, Temple, E.C.4.

Strauss (Rubber) Ltd. (686,043). March 10. Capital: £100,000 in £1 shares. The first directors are to be appointed by the subscribers.

Cable Connell Ltd. (686,406). March 14. Capital: £1,000 in £1 shares. To carry on the business of manufacturers and processors of, and dealers in, plastics, modelling and moulding materials, substances and compositions, etc. The directors are: Gordon E. P. Cable, Needham Lodge, Bray, Maidenhead, Berks; Peter Connell, 11 Fieldsway House, Fieldsway Crescent, N.5. Regd. office: Tudor House, 58 King Street, Maidenhead, Berks.

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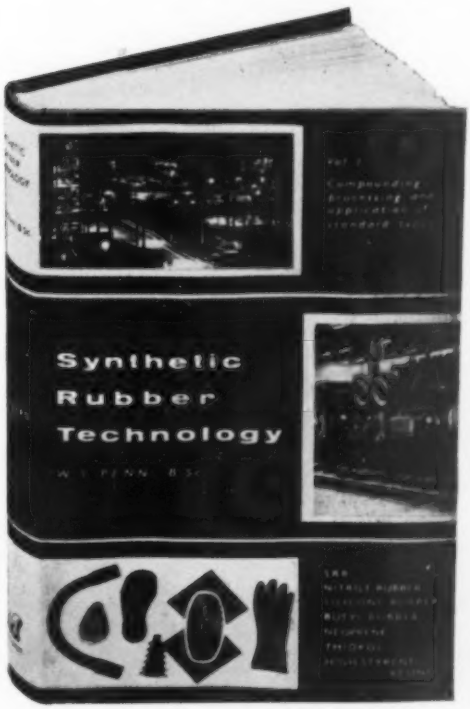

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